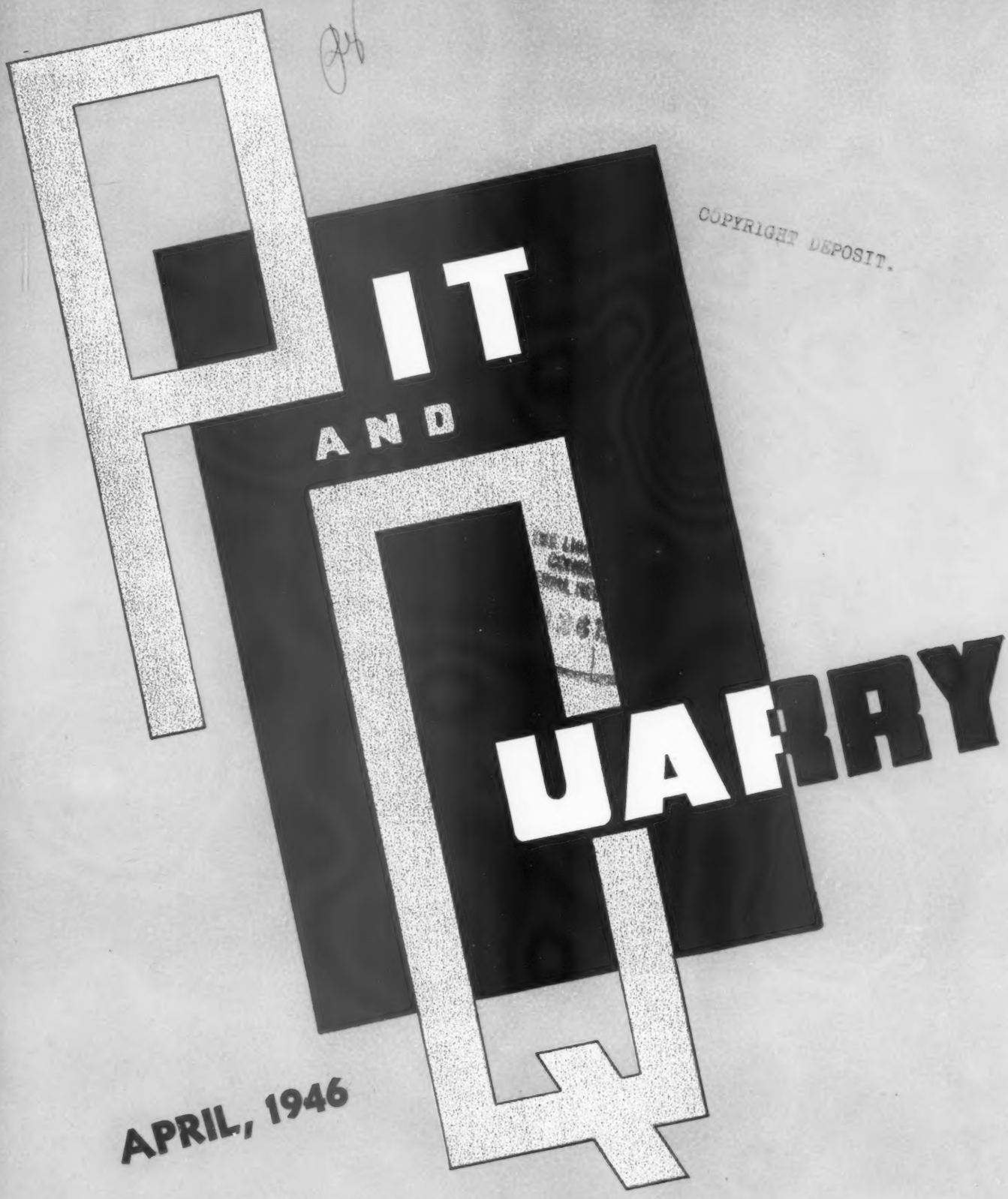

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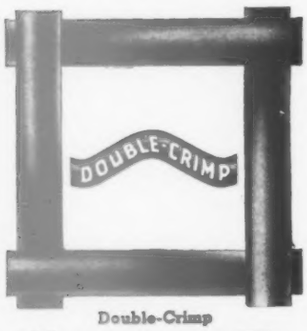
APRIL, 1946

FOR 29 YEARS THE LARGEST PRODUCER CIRCULATION IN THE FIELD

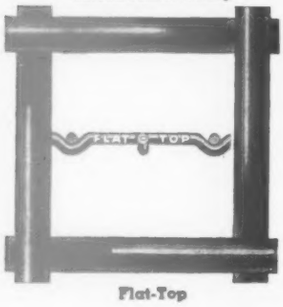
JUN 21 1946



Double-Crimp

Arch-Crimp

Intermediate-Crimp



Flat-Top

"The Perfect"

Wire Cloths and Screens

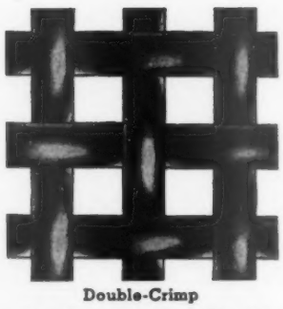
We have been specialists for many years in the making of precision wire cloths, wire screens and woven wire products.

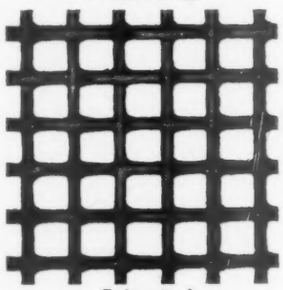
We apply our same precision principles in fabricating wire cloths into finished industrial units, for production or processing equipments or for permanent parts of countless industrial products.

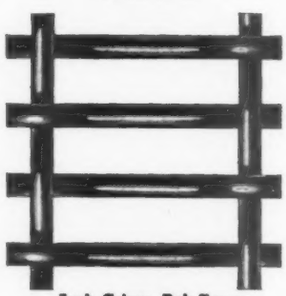
We invite your inquiries for wire cloths of all commercial metals or alloys or weaves, in continuous lengths or cut to size, or processed to meet your individual requirements.

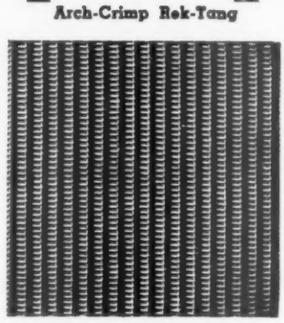
"Perfect" alloys and metals	"Perfect" Wire Cloth weaves	"Perfect" Wire Cloth Processing	"Perfect" Wire Cloth products
Super-Loy	Arch-Crimp	Bending	Baskets
Steel	Coiled	Binding	Circles
Galvanized	Double-Crimp	Brazing	Cones
Tinned	Double-Fill	Calendering	Crates
Stainless Steel	Dutch	Clinching	Cylinders
Nickel-Chromium alloys	Filter	Cutting	Discs
Aluminum	Flat-Top	Dipping	Forms
Brass	Herringbone-Twill	Dishing	Leaves
Bronze	Intermediate-crimp	Flanging	Lengths
Commercial Phosphor	Rek-Tang	Flattening	Panels
Copper	Selvage-Edge	Forming	Pieces
Monel Metal	Straight-Warp	Framing	Racks
Nickel	Stranded	Galvanizing	Ribbons
Any special alloys available in rod or wire form	Sta-Tru	Painting	Rolls
	Triple-Warp	Shearing	Sections
	Twilled	Slitting	Segments
	Twisted-Fill	Trimming	Spaces
	Twisted-Warp	Arc-Welding	Strips
		Gas-Welding	Template shapes
		Spot-Welding	Trays

We will follow your specifications and blue-prints exactly as your production engineers have prepared them—or we will submit suggestions for your approval.


Double-Crimp


Galvanized

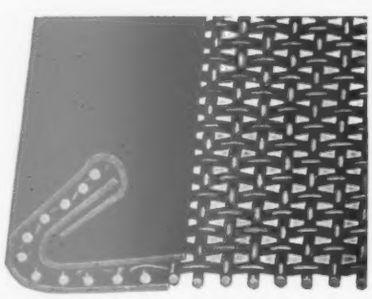

Arch-Crimp Rek-Tang


Dutch Weave

The LUDLOW-SAYLOR WIRE COMPANY

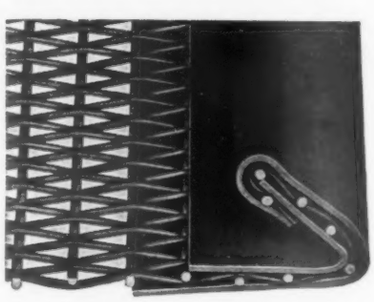
Newstead Avenue & Wabash Railroad

ST. LOUIS 10, MO.



LUDLOW-SAYLOR PRECISION FABRICATING makes vibrating-screen decks and jackets that are easily handled — quickly installed — need fewer adjustments and renewals.

Illustrations suggest only a few of the many available types of wire cloths and woven wire screens, which may be custom-finished with attachments to fit your particular processing installations.



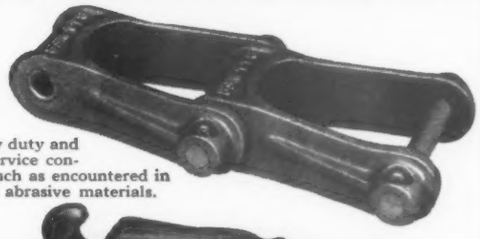
Chain by LINK-BELT

tested for service

You can be sure that Chain by Link-Belt will meet every requirement of performance. Design, material, workmanship must meet rigorous operating tests before the chain is permitted to become a part of your installation. Built to the highest standard of quality . . . and tested to meet these standards . . . Chain by Link-Belt will give you trouble-free service throughout the years.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8. Offices, Factory Branch Stores and Distributors in Principal Cities. 10.228



"800" Class Chain for heavy duty and severe service conditions such as encountered in handling abrasive materials.

Ewart Detachable Link-Belt. A widely used chain for average service on drives, elevators and conveyors.

"SS" Class Short Pitch. For medium and heavy duty drives; made with offset or straight side bars; with or without bushings or rollers.

"C" Class Combination iron and steel chain for heavy-duty elevators handling semi-abrasive or sticky materials.

LINK-BELT

CHAINS AND SPROCKETS

for conveyors • for drives • for power transmission

Silverlink Roller Chain for drives and conveyors.

PIT AND QUARRY, April, 1946, Vol. 38, No. 10. Published monthly by the Complete Service Publishing Company, 538 South Clark Street, Chicago 5, Ill. Subscription price $2 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $1 additional for each year. Single copies 25 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1897.

75 Years Young

Upson-Walton, the only company in the United States which combines the manufacture of wire rope, wire rope fittings and tackle blocks, celebrates its 75th birthday this month.

By all standards, except spirit, ours is an old company. But spirit keeps us young so that, at 75, we look ahead..not back..to more mature development.

At 71, we built the newest wire rope mill in the country.

In our 73rd and 74th years we made more engineering improvements in the Upson-Walton line than had been made for 20 years previously.

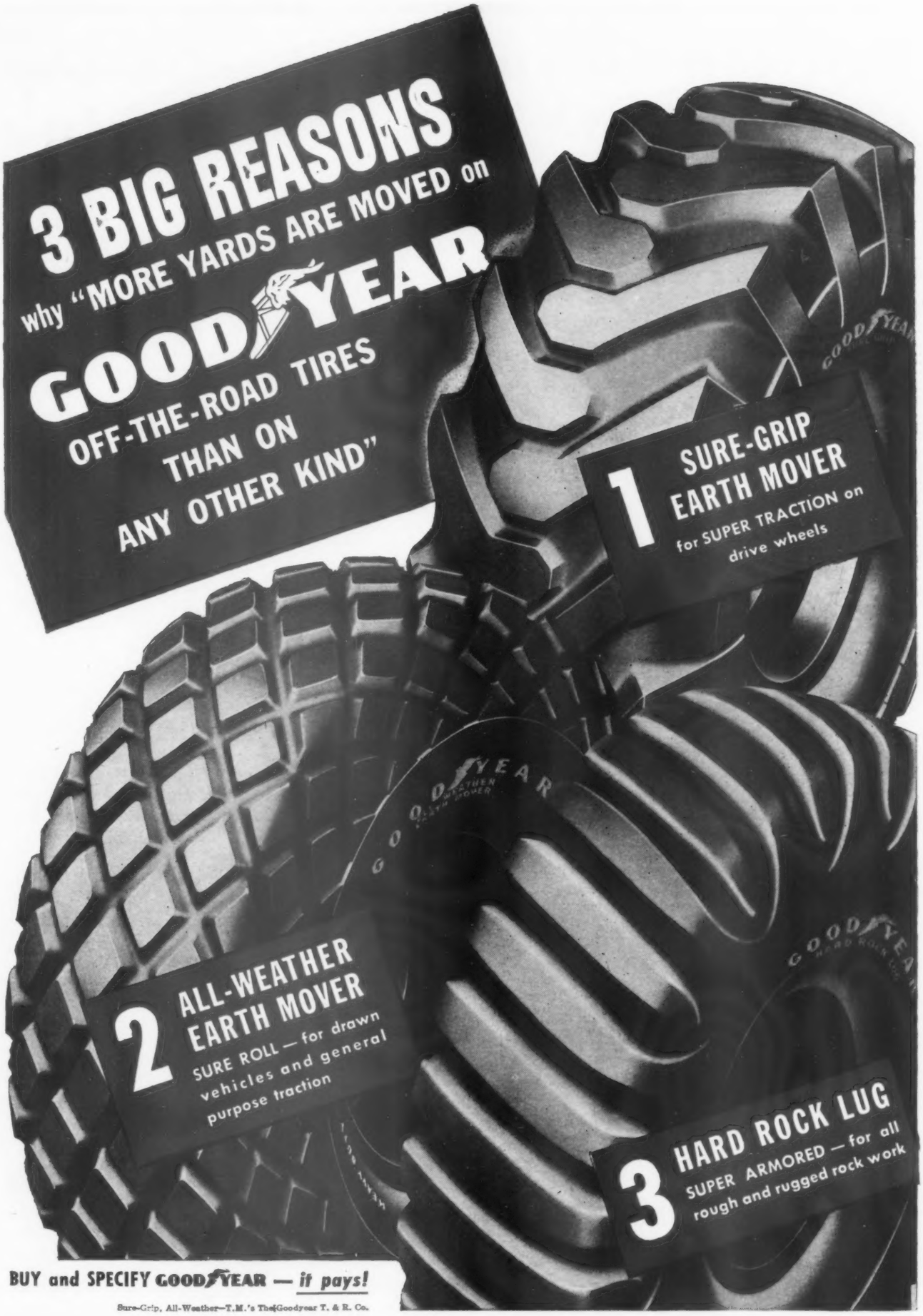
Now, at the ripe young age of 75 we enter the prime of our corporate life, confident that our years of greatest usefulness are still ahead. And that, more and more, a reconverting America will find that the improved Upson-Walton products are really better products.

The Upson-Walton Company

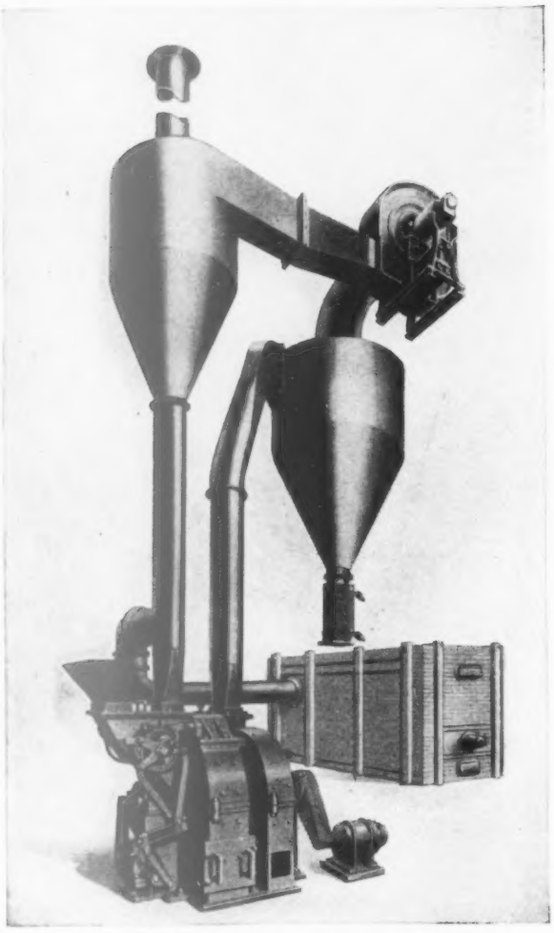
MANUFACTURERS OF WIRE ROPE. WIRE ROPE FITTINGS AND TACKLE BLOCKS

NEW YORK • PITTSBURGH • CLEVELAND • CHICAGO

Copyright 1943—The Upson-Walton Company


3 BIG REASONS
why "MORE YARDS ARE MOVED on GOODYEAR
OFF-THE-ROAD TIRES THAN ON ANY OTHER KIND"
1 SURE-GRIP EARTH MOVER
for SUPER TRACTION on drive wheels
2 ALL-WEATHER EARTH MOVER
SURE ROLL — for drawn vehicles and general purpose traction
3 HARD ROCK LUG
SUPER ARMORED — for all rough and rugged rock work
BUY and SPECIFY GOODYEAR — it pays!
Sure-Grip, All-Weather—T.M.'s The Goodyear T. & R. Co.

You can do your *Drying-Grinding Operations* all in ONE Machine



Raymond IMP MILL with Flash Drying System for removing moisture while pulverizing.

● DRYING
● GRINDING
● SEPARATING
● FIRING

with the Raymond

·IMP· MILL

of 1000 Uses

SINCE 1887

Typical jobs of this versatile Imp Mill include:

Handling ball clays directly from the pits . . . reducing initial moisture of about 25% to a final content of 5% and at the same time pulverizing and separating the clay to a fineness of 95% through 100-mesh.

Processing chalk for fillers used in paint and rubber manufacture . . . drying raw material from 10% down to 2% final moisture, while grinding product to a fineness of 99% passing 100-mesh.

Calcining gypsum for making wallboard . . . handling raw gypsum containing approximately 25% surface and combined moisture, and delivering a finished product with a 5% moisture content.

For further details and applications of the Raymond Imp Mill, ask for Catalog No. 55.

RAYMOND PULVERIZER DIVISION

COMBUSTION ENGINEERING COMPANY, INC.

1321 North Branch Street — Chicago 22, Illinois

Sales Offices in Principal Cities — Canada: Combustion Engineering Corp., Ltd., Montreal

now you can make money on the smaller black top jobs, too!

the Cedarapids PATCHMASTER

Continuous Mixing

Portable . . . Stationary . . . Low Cost

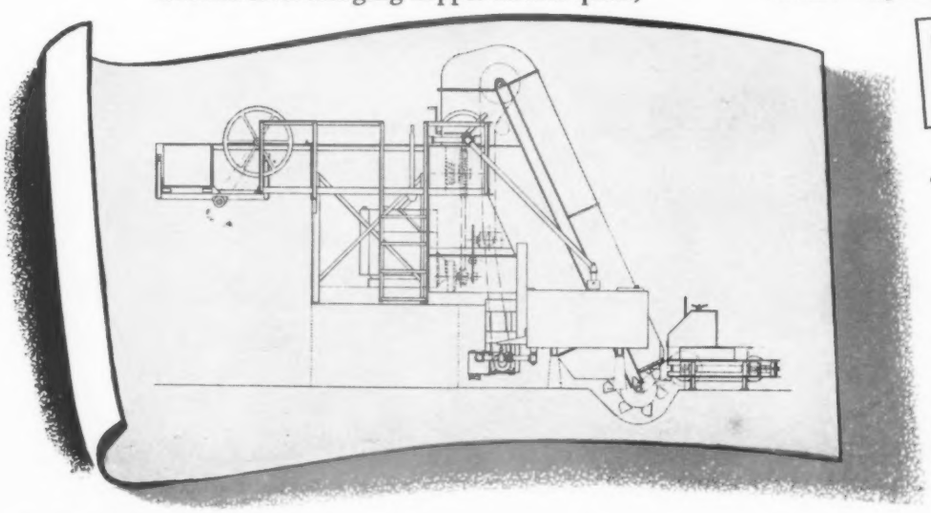
HERE'S the asphalt mixing plant that will really put money into your pockets on all small and medium sized jobs. 25 to 30 tons an hour—150 to 250 tons per day—of uniform, thoroughly coated and mixed aggregate are a cinch for the Patchmaster. Set it up as a permanent plant wherever you have a regular demand for patching material. Keep it on pneumatics if your jobs are widely scattered. Either way you'll find it is the handiest, most profitable maintenance plant you ever saw. You'll be amazed at its accuracy, economy and high capacity. By adding a drier you can handle hot mixes as well.

Ground-level charging hopper assures quick, easy loading. Truck-high pug mill discharge eliminates troublesome delivery conveyor belts. Every part is built to Cedarapids high quality standards for long life, trouble-free operation and low cost.

The Patchmaster is the ideal plant for contractors, townships, counties, cities, state highway departments, large industrial plants or anyone who wants a low-cost, low-priced asphalt mixing plant for their smaller black top jobs. See your nearest Cedarapids distributor or write for Bulletin PM-1.

IOWA MANUFACTURING CO.

Cedar Rapids, Iowa, U.S.A.



Cedarapids

Built by IOWA

THE IOWA LINE

of Material Handling Equipment Includes

ROCK AND GRAVEL CRUSHERS
BELT CONVEYORS—STEEL BINS
BUCKET ELEVATORS
VIBRATOR AND REVOLVING SCREENS
STRAIGHT LINE ROCK AND GRAVEL PLANTS
FEEDERS—TRAPS
PORTABLE POWER CONVEYORS
PORTABLE STONE PLANTS
PORTABLE GRAVEL PLANTS
REDUCTION CRUSHERS
BATCH TYPE ASPHALT PLANTS
TRAVELING (ROAD MIX) PLANTS
DRAG SCRAPER TANKS
WASHING PLANTS
TRACTOR-CRUSHER PLANTS
STEEL TRUCKS AND TRAILERS
KUBIT IMPACT BREAKERS

SAVES

time where it counts the

MOST!

SOCONY-VACUUM OIL COMPANY, INC., and Affiliates: Magnolia Petroleum Company, General Petroleum Corporation of California

Out on the Job—in your maintenance department this Complete Lubrication Service helps speed operations!

To minimize breakdowns and repairs—boost machine output—Socony-Vacuum offers you the technically correct oil or grease for *every* part of *every* piece of equipment you use. Correct Lubrication helps keep . . . . . *Machines on Schedule!*

Regardless of *where* you operate, Socony-Vacuum's vast distribution system can cut down field interruptions for refueling and lubrication, help simplify your inventory problems. Our representative arranges. . . . . *Deliveries on-the-Job!*

To reduce "down-time" for overhauls and repairs, our complete service provides job-proved maintenance schedules adapted to your special needs—*plus instruction for inexperienced help* on Correct Lubrication. Result. . . . . *Less Costly Maintenance!*

Aid with balky machines that disrupt schedules! If lubrication is the cause, our representative can make proper recommendations—in critical cases, will call in expert counsel to correct the trouble. You're sure of. . . . . *Help with "Problem" Equipment!*

Why Be Satisfied Merely With "Gas and Oil" When You Can Get Complete Service!

Tune in "Information Please"—Monday Evenings, 9.30 E. S. T.—NBC

The BIG SAVING is in Man and Machine Hours

ROLLWAY RIGHT-ANGLE LOADING

means fewer shutdowns for bearing service and replacement

In general, right-angle loading gives Rollway Roller Bearings a longer life expectancy. That's a saving in itself, but it is relatively unimportant when you consider the enormously greater savings in man hours and machine hours which this longer bearing life provides. Machines run at peak production for longer periods. Fewer skilled men stand idle while bearings are serviced or replaced. There are fewer interruptions of the production schedule.

The Advantages You Get From Right-Angle Loading

1. Solid cylindrical rollers of greater roller mass and uniform roller cross-section . . . greater resistance to shock loads and vibration . . . longer life expectancy under continuous heavy-duty service.

2. All loads carried at right-angles to the roller axis. No compound loads, no oblique loads, and no resultants of oblique loads can be brought to bear.

3. No wedging of rollers . . . no pinch out . . . less roller end-rub and wear-back . . . less rubbing friction.

4. Only pure radial or pure thrust loads can be imposed upon any single bearing assembly. Unit pressures per roller are substantially reduced.

5. Greater load-carrying capacity in any given dimension. Housings can be smaller and more compact. Weight of design can be reduced.

Select Bearings For the Job They Do

Our engineering specialists will gladly make necessary calculations, drawings and supply the information required for a complete understanding of the problem. No charge or obligation.

ROLLWAY CYLINDRICAL ROLLER BEARINGS

SALES OFFICES: Philadelphia • Boston • Pittsburgh • Youngstown • Cleveland • Detroit • Chicago • St. Paul • Houston • Tulsa • Los Angeles

GET-- MORE YARDAGE AT LOWER COST! WITH

HENDRIX *Lightweight* DRAGLINE BUCKETS

10% to 14% Manganese
Chains and fittings are standard
on all types and sizes.

3/8 to 30 Cubic Yds.

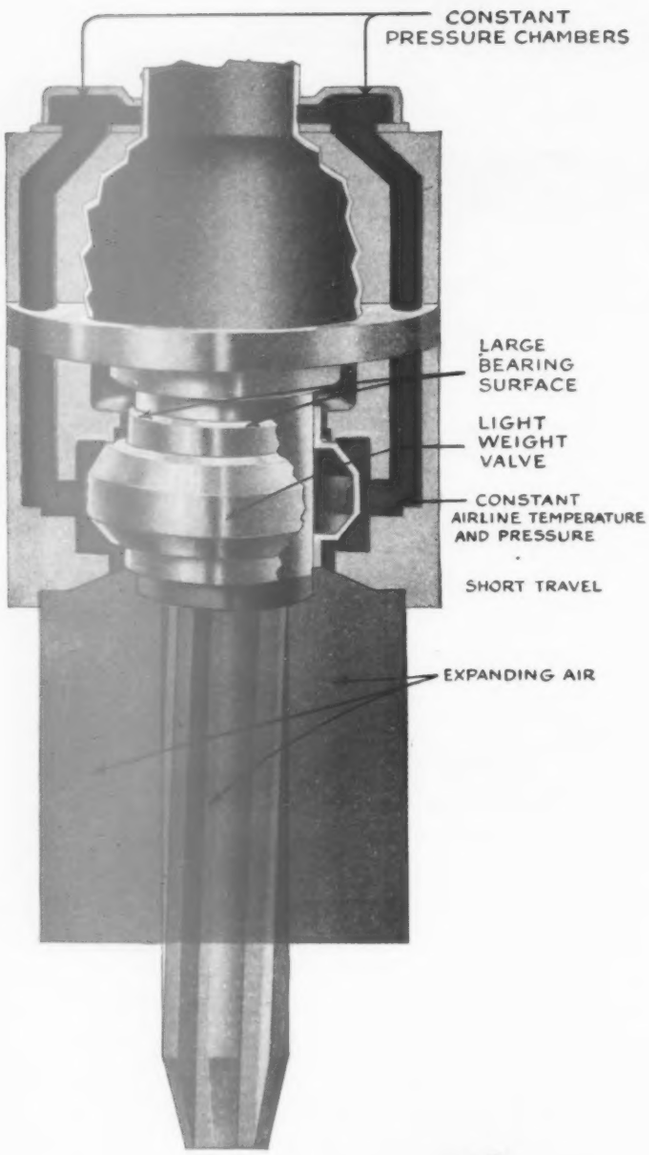
- ★ 20% to 40% lighter than other buckets, type for type.
- ★ All welded construction for greater strength and durability.
- ★ Manganese Steel chains, fittings, and reversible tooth points.
- ★ Full Pay Load every trip, even in wet diggings.
- ★ Perfect Balance; handles easier, fills faster, dumps cleaner.
- ★ Three Types; light, medium, and heavy duty. With or without perforations.

You automatically step up the YARDAGE of your dragline by hooking up a Hendrix Lightweight Bucket! It's 20% to 40% lighter than other buckets, type for type! Can be used on a machine designed for small operations and still maintain the allowable loaded weight. You'll get bigger payloads on operations requiring a long boom, and in wet digging you'll increase your payloads by leaving the water in the pit. We took the load *out of the bucket* . . . to let you put it *inside!*

WRITE FOR DESCRIPTIVE LITERATURE—
OR ASK YOUR DEALER

DESOTO FOUNDRY, INC. • MANSFIELD, LOUISIANA

WHY LEADING MINING MEN SPECIFY Thor ROCK DRILLS



The ENGINEER knows that . . .
Thor's Light Weight, Short-Travel Valve Produces More Work—Cuts Operating Costs!

The Valve is to an air tool what the carburetor is to an automobile engine . . . the vital *heart* controlling the inlet of power. So intricate is the valve, however, that only engineers who know its function recognize what benefits it can contribute to an air tool's performance and service life.

Leading engineers everywhere specify Thor Tools because Thor valves provide *faster, better work—at lower operating costs*—through these features:

SPEED . . . *Air Economy*. Extremely light in weight, the Thor Valve moves faster to provide more blows per minute. It maintains this relative high efficiency even at low air line pressures.

POSITIVE ACTION. Light weight, short-travel—and the important fact that the Thor Valve is actuated by the difference between air line pressure and exhaust pressure—assures positive action that *completes every blow.*

ENDLESS LIFE. Light weight and short-travel—plus the *large bearing surface* on which the Thor Valve operates—eliminates breakage . . . reduces wear to a minimum.

NON-FREEZING . . . *Never "Air-starved."* Constant pressure chamber maintains air at constant line temperature and pressure. Air cannot expand until it passes valve . . . thus valve cannot "freeze."

EXACT TIMING and BALANCE. All these valve functions are in perfect-timing and balance with the piston hammer. Every stroke is air-cushioned; every blow is complete and powerful.

Have your engineer check these Thor advantages. He'll agree—your nearby Thor Distributor stocks the tools that will give you *more work . . . at lowest cost!*

INDEPENDENT PNEUMATIC TOOL COMPANY
600 W. Jackson Boulevard, Chicago 6, Illinois
BIRMINGHAM BOSTON BUFFALO CLEVELAND DETROIT LOS ANGELES MILWAUKEE NEW YORK PHILADELPHIA
PITTSBURGH ST. LOUIS SALT LAKE CITY SAN FRANCISCO TORONTO, CANADA LONDON, ENGLAND

Thor PORTABLE POWER TOOLS

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS

"More hauls, fewer overhauls, with
Gulf Quality Lubricants"
says this Hauling Contractor*

*A. G. Wimpy, Dahlonega, Georgia, keeps his big fleet of trucks busy hauling hot mix asphalt and other road materials for a number of Georgia highway contractors. Like many other leading hauling contractors, he reports top performance from equipment with Gulf lubricants and fuels in service.

"WHEN a customer's job is ready for paving, we have to keep our trucks moving fast—and we can't take chances on breakdowns," says A. G. Wimpy, prominent hauling contractor of Dahlonega, Georgia. "That's why we specify Gulf lubricating oils and greases. These quality lubricants help us get more hauls, fewer overhauls, and lower maintenance costs."

Here's one important reason why so many leading contractors report such excellent performance from Gulf quality lubricants: Gulf lubricants have longer life and superior lubricating value—two assets that insure greater protection for equipment and a minimum of costly delays.

You, too, can benefit by using Gulf quality lubricants on your next contract. Write, wire, or phone your nearest Gulf office today and ask a Gulf Service Engineer to call. He will recommend the proper types and grades exactly suited for your requirements.

GULF

Gulf Oil Corporation
Gulf Refining Company

Division Sales Offices:
Boston · New York · Philadelphia · Pittsburgh
Atlanta · New Orleans · Houston · Louisville · Toledo

Make this test with

ATLAS ROCKMASTERS

as you open your quarry this spring

In dozens of quarries all over the country, the use of the Atlas Rockmaster System has greatly increased shovel output . . . reduced secondary blasting and backbreak . . . cut down complaints on vibration. Can it do as much for you?

One sure way to find out is to test this new and revolutionary blasting system. Try one series of blasts with your old system, another with the new. If results aren't better—*amazingly better*—your experience will be a unique one indeed.

Remember, however, that the Atlas Rockmaster System involves some entirely new ideas in the application of explosive force. To realize the full potentialities of this first commercial blasting development since the war, call in your Atlas Representative.

Check these Results

- ✓ **NOISE AND CONCUSSION** are drastically cut down
- ✓ **BREAKAGE** is decidedly more complete
- ✓ **SECONDARY BLASTING** is reduced to a minimum
- ✓ **BACKBREAK** can be greatly reduced—more solid footage is assured

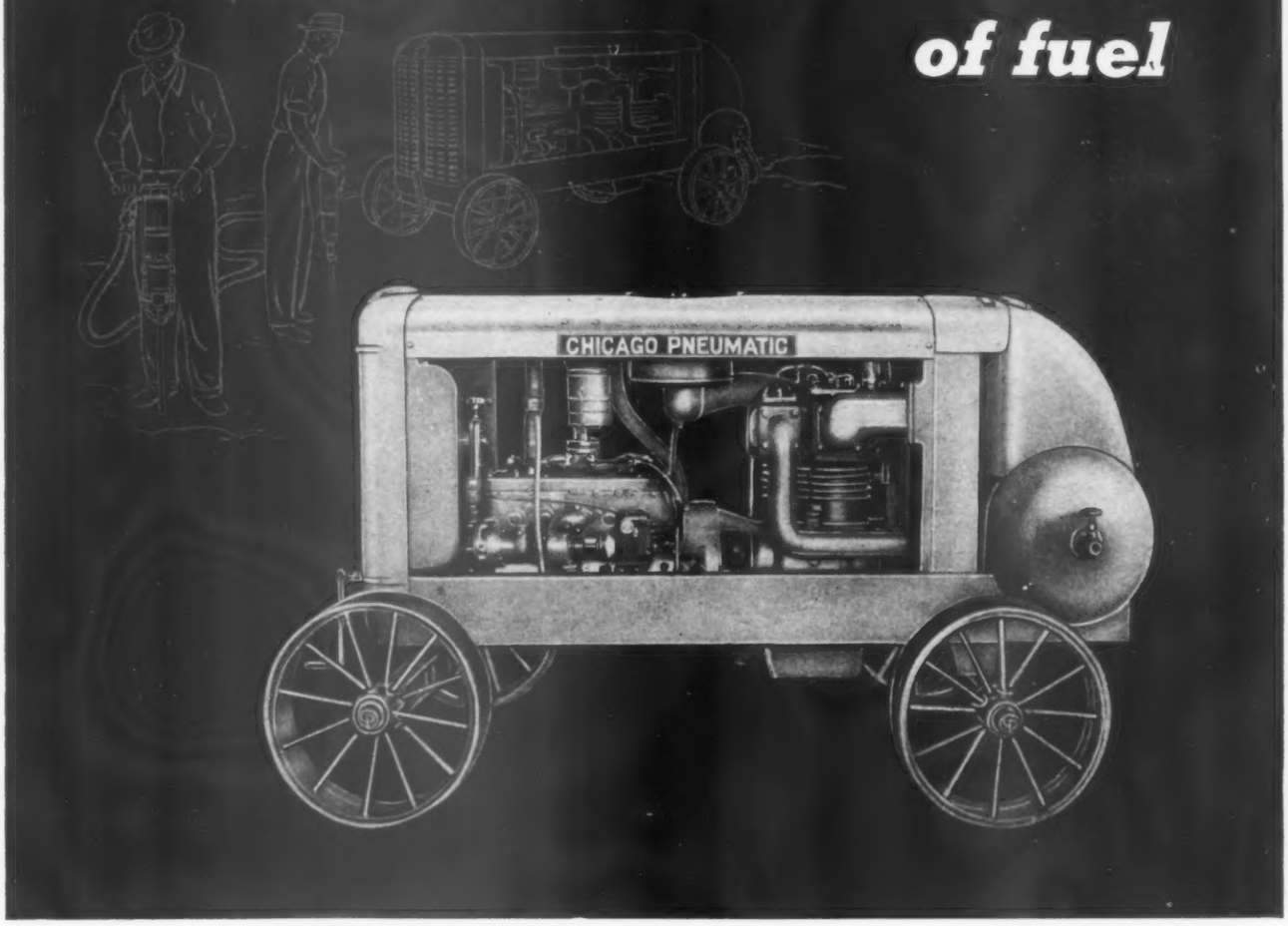
Identify ROCKMASTERS by the Blue Color

ATLAS EXPLOSIVES
"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington 99, Del. • *Offices in principal cities* • *Cable Address—Atpowco*

15% to 35% more air per gallon of fuel



CP PORTABLE COMPRESSORS

AN outstanding feature of CP Portable Compressors is the gradual speed regulator. Synchronizing engine speed with air demand, it varies the speed—not by steps but gradually – up and down, exactly as air demand varies. The result is a marked economy of fuel and a reduction in wear. CP's complete line of gasoline and Diesel powered compressors offers greater portability due to lighter, more compact construction. For full information write for Bulletin 758-2.

Chicago Pneumatic Portable Compressors are available in gasoline powered models of 60, 105, 160, 210 and 315 c.f.m.; and in Diesel powered sizes of 105, 160, 210, 315 and 500 c.f.m.; with steel wheels, pneumatic-tired wheels or skid mountings.

★★★★★★★★★
PNEUMATIC TOOLS
ELECTRIC TOOLS
HYDRAULIC TOOLS
ROCK DRILLS

CHICAGO PNEUMATIC
TOOL COMPANY
General Offices: 8 East 44th Street, New York 17, N. Y.

★★★★★★★★★
AIR COMPRESSORS
VACUUM PUMPS
DIESEL ENGINES
AVIATION ACCESSORIES

Here are 5 reasons why

. . . MANY MANUFACTURERS SPECIFY **BEMIS** MULTIWALL PAPER SHIPPING SACKS

1

CONTROLLED QUALITY

Materials for Bemis Multiwall Paper Shipping Sacks are carefully selected and laboratory tested before they are O.K.'d for use on our production lines. Typical is the tensile strength test, illustrated at right.

2

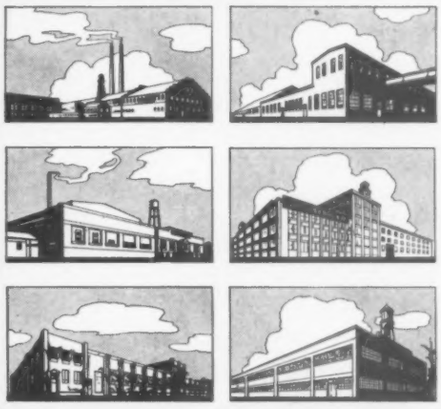
BETTER BRAND PRINTING

Our Six Multiwall plants are equipped with modern printing equipment. Skilled engravers make the plates that reproduce your brand, and our own laboratories develop and test the brilliant colorful inks that are used.

REAL PACKAGING SERVICE

Bemis Multiwall Specialists are always at your service—ready to help you solve tough packaging problems, study your present methods of filling, closing and handling and recommend changes that may lower costs and speed up production.

3



SIX BEMIS MULTIWALL PLANTS

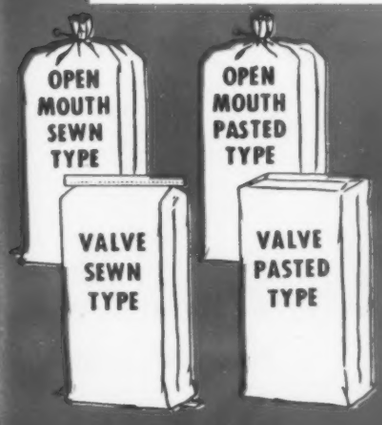
are strategically located North, South, East, and West to provide easy accessibility, quick delivery to your main plant or branches regardless of location. Bemis offices in 26 additional cities assure you of top-notch service.

4

A NATIONWIDE ORGANIZATION

There is a Bemis representative near you because Bemis offices are located in 32 principal cities. When you need Multiwalls, call Bemis. You'll find it pays to be a Bemis Multiwall customer.

5



BEMIS BRO. BAG CO.

Baltimore • Boston • Brooklyn • Buffalo
Charlotte • Chicago • Denver • Detroit
Houston • Indianapolis • Kansas City
Los Angeles • Louisville • Memphis

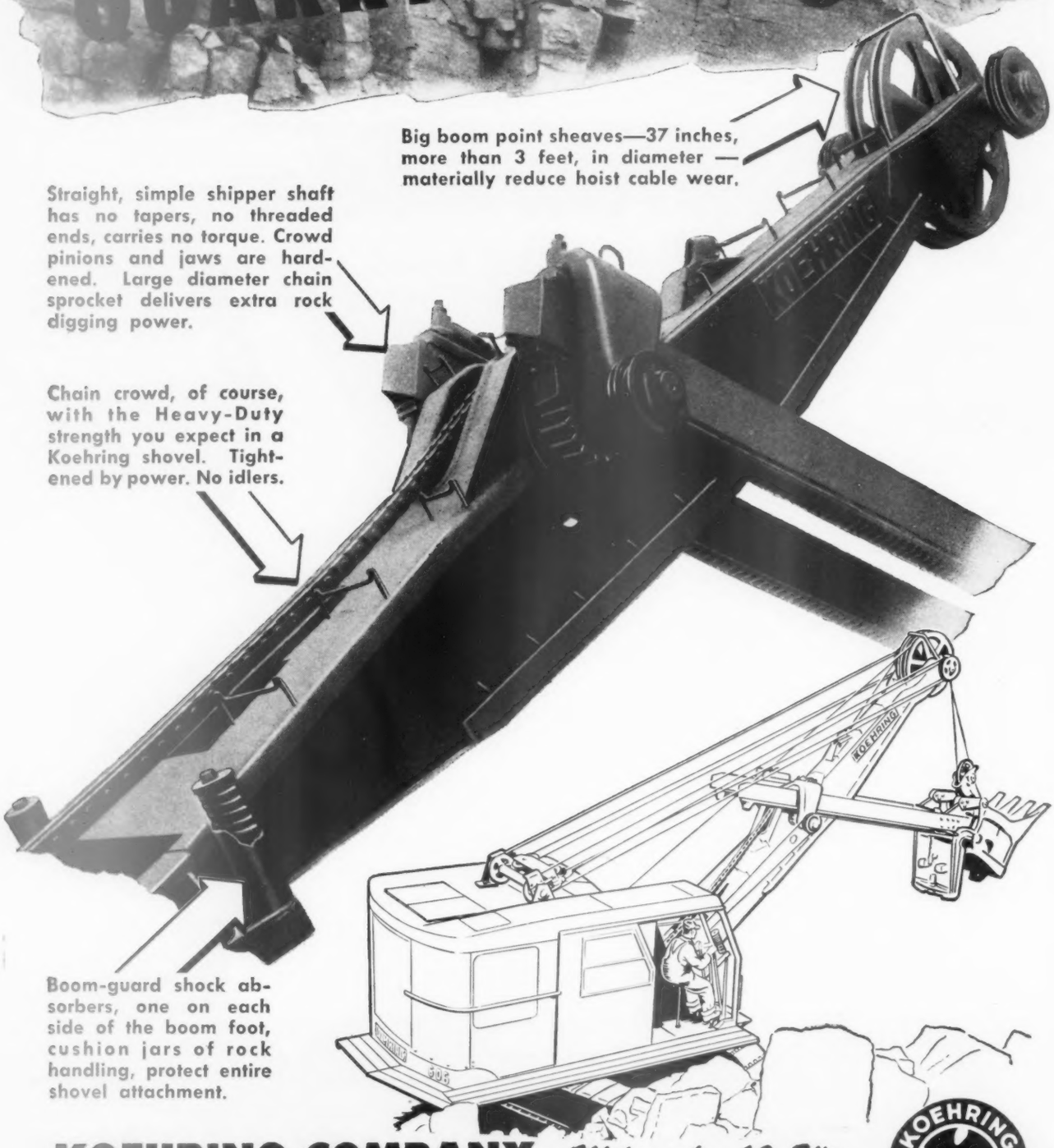
BEMIS BRO BAG COMPANY

Minneapolis • New Orleans • New York City • Norfolk • Oklahoma City
Omaha • Orlando • St. Louis • Salina
Salt Lake City • Seattle • Wichita

PEORIA, ILL. • E. PEPPERELL, MASS. • MOBILE, ALA. • WILMINGTON, CAL.
SAN FRANCISCO, CAL. • ST. HELENS, ORE.

KOEHRING 605

STOVL BOOM FOR QUARRY-DUTY



Big boom point sheaves—37 inches, more than 3 feet, in diameter — materially reduce hoist cable wear.

Straight, simple shipper shaft has no tapers, no threaded ends, carries no torque. Crowd pinions and jaws are hardened. Large diameter chain sprocket delivers extra rock digging power.

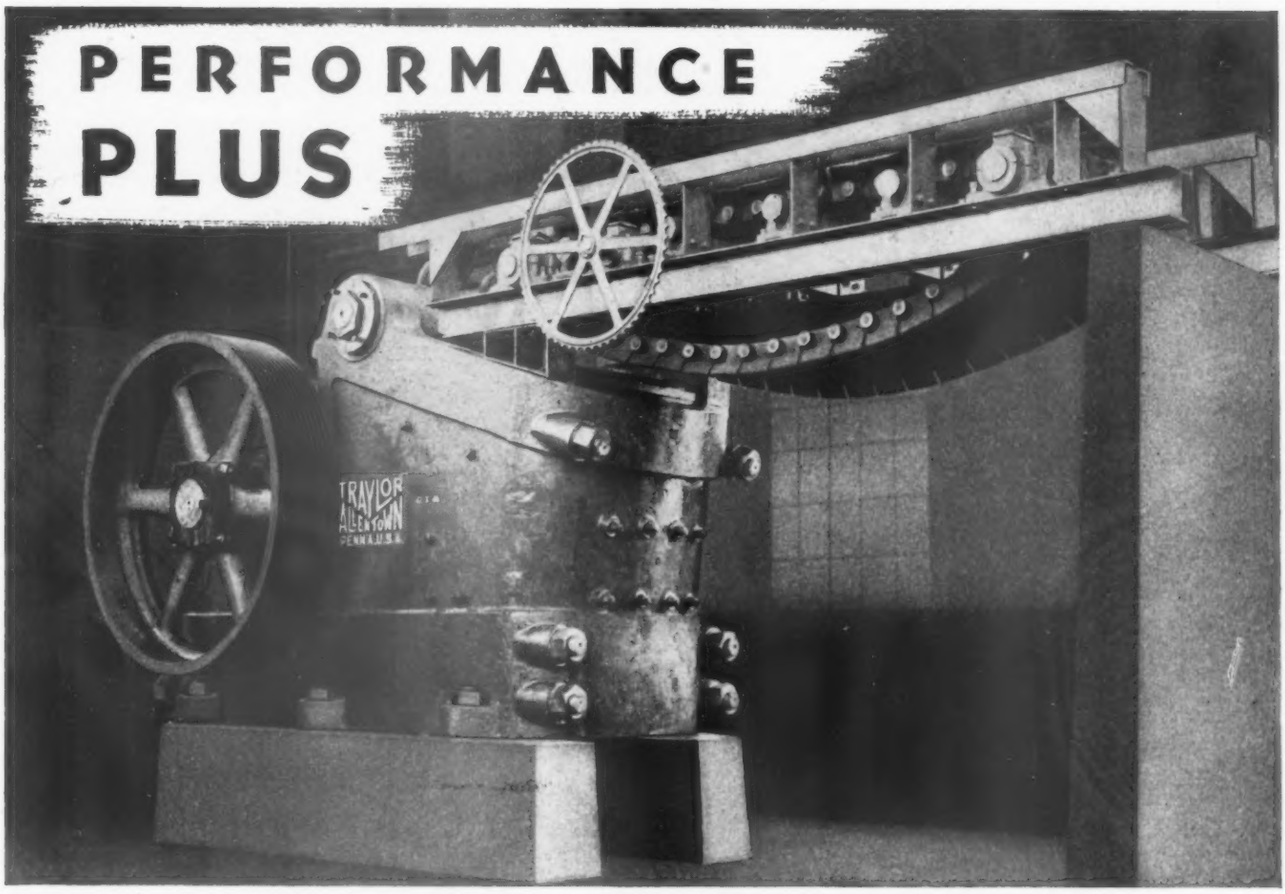
Chain crowd, of course, with the Heavy-Duty strength you expect in a Koehring shovel. Tightened by power. No idlers.

Boom-guard shock absorbers, one on each side of the boom foot, cushion jars of rock handling, protect entire shovel attachment.

KOEHRING COMPANY, *Milwaukee 10, Wis.*

KOEHRING HEAVY DUTY

HEAVY-DUTY CONSTRUCTION EQUIPMENT



WE BUILD

Rotary Kilns
Rotary Coolers
Rotary Dryers
Rotary Slakers
Scrubbers
Evaporators
Jaw Crushers
Gyratory Crushers
Reduction Crushers
Crushing Rolls
Grinding Mills
Ball Mills
Rod Mills
Tube Mills
Pug Mills
Wash Mills
Feeders
Rotary Screens
Elevators

Just what every operator needs in these days of greater demand for his product.

The Traylor Type R Jaw Crusher will give you that "plus" needed for extra production.

It has a scientifically reinforced frame—is easy to inspect and repair—has a patented swing jaw suspension that reduces maintenance—has smooth-faced patented curved jaw plates that increase production—has an improved rod type pitman—a three-bearing toggle system that reduces frictional loss—a simple time-tried safety device that prevents breaking any important part of the crusher.

All of these summed up mean sturdy construction—lower upkeep—steady production.

An all steel Traylor Apron Feeder used in combination with a Type "R" Crusher gives further assurance of sufficient quantity of your product to take care of this greater demand.

Ask our representative to call at your convenience or write for Bulletins on these machines.

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P.O. Box 550 Place D'Armes Station, Montreal, Canada

What's Materials Handling Costing You?

IF YOU THINK YOUR COSTS ARE LOW . . . BETTER CHECK THE QUARRIES USING THE DEMPSTER-DUMPSTER SYSTEM!

One close look at the above illustration and you get a rough idea of why the Dempster-Dumpster System of materials handling assures tremendous savings in any quarry. Here twenty-five Dempster-Dumpster heavy-duty bodies of 3-ton capacity each go through continuous, around-the-clock loading while only two trucks, equipped with Dempster-Dumpster Hoisting Units, are constantly on the move hauling loaded bodies to dumping point and returning empty bodies for more loaded ones . . . an endless cycle of efficient, top-production, low-cost service.

The Dempster-Dumpster system of haulage is recognized by progressive rock, cement and lime plants, throughout the U.S.A. as essential standard equipment for minimum production cost.

But, the Dempster-Dumpster is even more necessary now than ever before. One unit often eliminates 3 out of 4 trucks in previous service . . . and that means cutting costs low. In means eliminating much equipment investment. It means cutting maintenance costs, tire and gas requirements. But most important now, it means increased production with a minimum of manpower.

Our engineers are available to help you meet today's materials handling demand. Write for Catalog 245 that shows exactly how and why the Dempster is necessary for minimum production costs in the rock products field. Dempster Brothers, Inc., 146 Shea Rd., Knoxville, Tennessee.

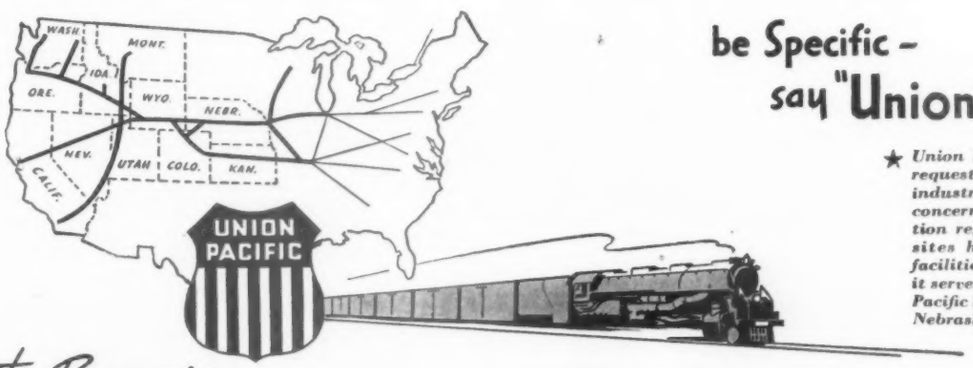
DEMPSTER DUMPSTER
TRADE MARK REG.

Pictured above is another reason why Union Pacific can maintain fast schedules. It's one of the "Big Boys," 600-ton super-powered freight locomotives designed to meet industry's heaviest demands.

But it takes more than horsepower to keep shipments rolling on schedule. The "know how" of many thousands of trained Union Pacific employees . . . the time-saving Strategic Middle Route uniting the East with the West Coast . . . are *plus* advantages only Union Pacific provides.

Union Pacific traffic experts are located in metropolitan cities from coast to coast. Call on them to assist in solving your transportation problems.

For efficient, dependable freight service—



be Specific –
say "Union Pacific"

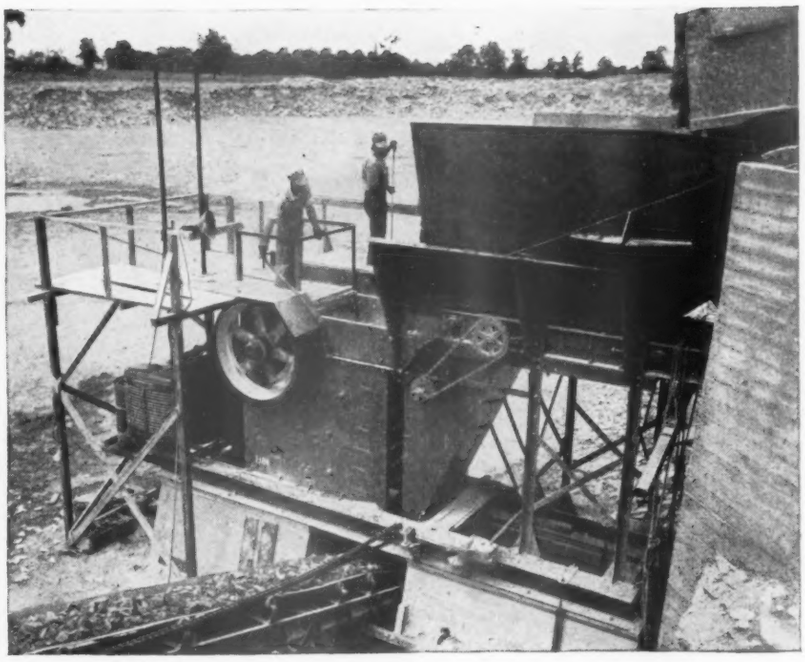
★ *Union Pacific will, upon request, gladly furnish industrial or mercantile concerns with information regarding available sites having trackage facilities in the territory it serves. Address Union Pacific Railroad, Omaha, Nebraska.*

The Progressive

UNION PACIFIC RAILROAD

The Strategic Middle Route

This plant, with 25" x 40" Jaw Crusher and Apron Feeder, will produce 50 yards of 2-inch crushed rock per hour.



50 CU. YDS. or 500 CU. YDS.

THE AUSTIN-WESTERN LINE OF CRUSHING EQUIPMENT INCLUDES:

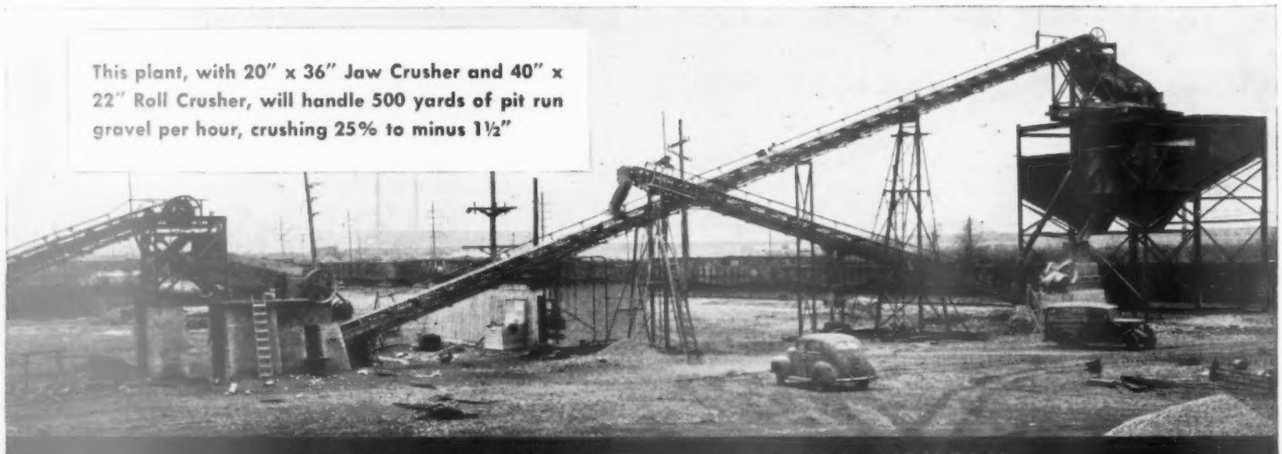
Jaw Crushers and Roll Crushers in a wide range of sizes; plus matching screens, elevators, conveyors, and bins.

Semi-portable and portable crushing and screening plants, from the smallest to the magnificent two-unit and three-unit plants which combine maximum output with wide variety of specification, and make it possible for the owner of a stationary plant to reach out into new territories.

Your nearby Austin-Western distributor will be glad to recommend the plant or equipment best suited to your needs.

AUSTIN-WESTERN COMPANY, AURORA, ILL., U.S.A.

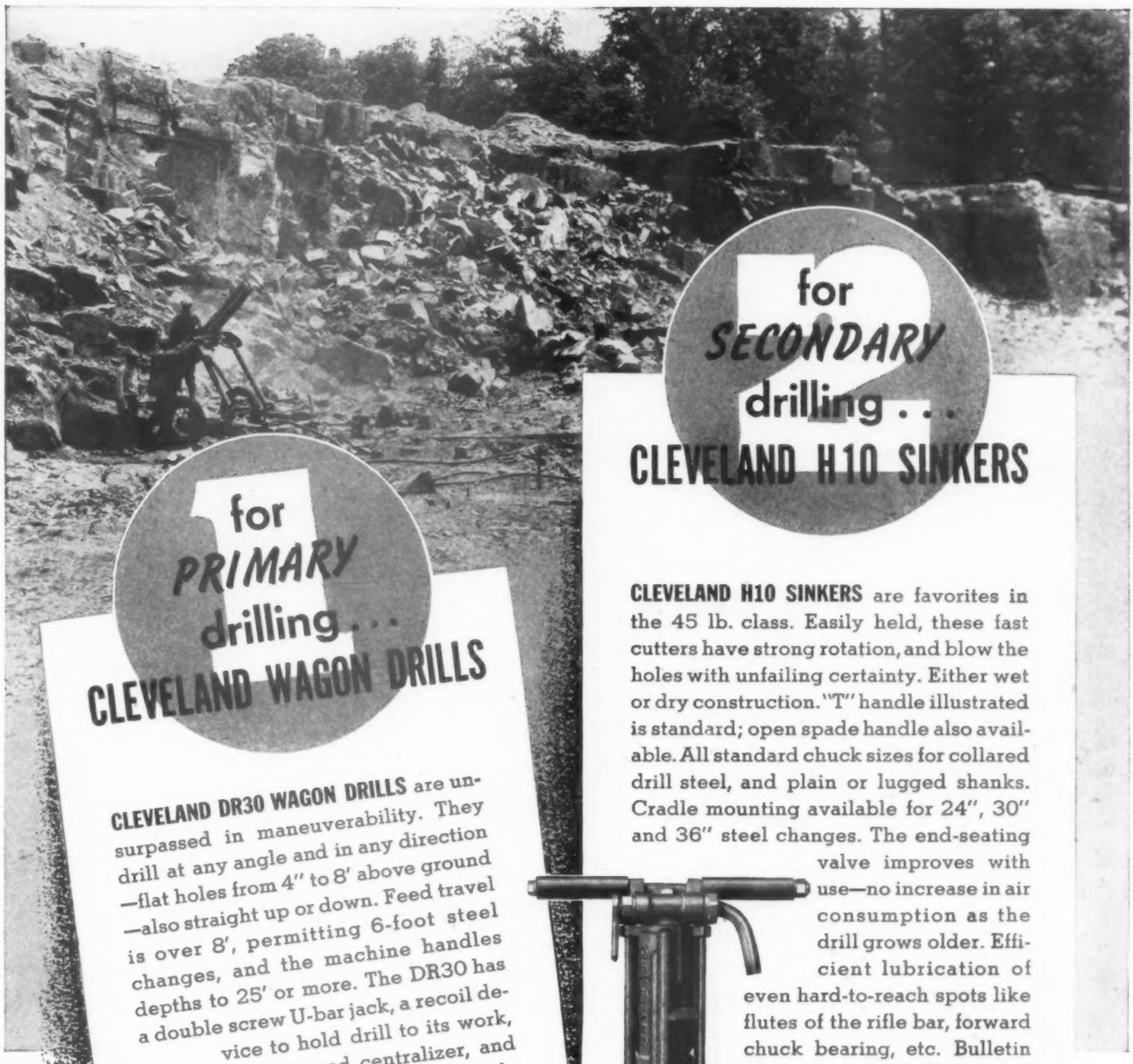
This plant, with 20" x 36" Jaw Crusher and 40" x 22" Roll Crusher, will handle 500 yards of pit run gravel per hour, crushing 25% to minus 1½"



BUILDERS OF ROAD MACHINERY

Austin Western

SINCE 1859



1 for PRIMARY drilling . . .

CLEVELAND WAGON DRILLS

CLEVELAND DR30 WAGON DRILLS are unsurpassed in maneuverability. They drill at any angle and in any direction —flat holes from 4" to 8' above ground —also straight up or down. Feed travel is over 8', permitting 6-foot steel changes, and the machine handles depths to 25' or more. The DR30 has a double screw U-bar jack, a recoil device to hold drill to its work, an improved centralizer, and a forward leg point to steady the drill. All these features make the Cleveland DR30 the most popular wagon drill ever built. Ask for Bulletin 132.

2 for SECONDARY drilling . . .

CLEVELAND H10 SINKERS

CLEVELAND H10 SINKERS are favorites in the 45 lb. class. Easily held, these fast cutters have strong rotation, and blow the holes with unfailing certainty. Either wet or dry construction. "T" handle illustrated is standard; open spade handle also available. All standard chuck sizes for collared drill steel, and plain or lugged shanks. Cradle mounting available for 24", 30" and 36" steel changes. The end-seating valve improves with use—no increase in air consumption as the drill grows older. Efficient lubrication of even hard-to-reach spots like flutes of the rifle bar, forward chuck bearing, etc. Bulletin 122 describes Cleveland Sinkers in detail. Ask for it.

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CLEVELAND ROCK DRILL DIVISION

The Cleveland Pneumatic Tool Company

CABLE ADDRESS: "ROCKDRILL" • CLEVELAND 5, OHIO

LEADERS IN DRILLING EQUIPMENT

A cargo 5 million years old...

AND NEW MACK TRUCKS!

When the Pacific waters receded and the California coastline was formed, what had once been the floor of a calm bay was bared to the sun and air . . . and there lay a deposit of diatom, five miles square, 1400 feet thick—located at what is now known as Lompoc, California!

From this diatomaceous earth, now known as Celite, the Johns-Manville Company has been manufacturing everything from match heads to plastics and paints, and the entire gamut of insulation and filtration materials.

These products have added to better living. They were developed through unending research and years of hard work. So also the Macks that transported this Celite are the result of unending engineering research and an honest effort to supply a truck that will make your job easier and more profitable.

Keep pace with progress . . . make your next truck a Mack—Economical, Efficient; Harder-working with a Longer Life.

Mack
TRUCKS
FOR EVERY PURPOSE

Performance Counts!

Mack Trucks, Inc., Empire State Building, New York 1, N. Y. Factories at Allentown, Pa.; Plainfield, N. J.; New Brunswick, N. J.; Long Island City, N. Y. Factory branches and dealers in all principal cities for service and parts.

MEMO TO ALL CONSTRUCTION SUPTS.

Let's check how Haiss Hi-speed Loading Saves Time and Costs.

EJK—

SIMPLE CONVERSION MOUNTINGS Haiss simplified design of the Model 75 provides for quick interchange of creepers and wheels in the field. Standard parts. No shop work required.

When loading is tough and you can't keep trucks moving fast enough for profit, put your money on a Haiss. It's the Loader that's built to crowd a stock pile or bank and move it up to 8 yd.-a-minute speed . . . the Loader that's engineered to dig *anything* a man can shovel and do its own clean-up scraping. Haiss Loaders cost more, because they're worth more. They're worth more, because they're superbly engineered for greater mechanical reliability, greater overall operating economy. Investigate now how Haiss Hi-Speed Loading can save time and lower cost of your materials handling. Catalogs containing complete information will be mailed promptly on request.

GEORGE HAISS MFG. CO., INC.
142nd Street & Rider Avenue, New York 51, N.Y.
Distributors in all large cities.

HAISS

PORTABLE CONVEYORS ★ LOADERS ★ CLAMSHELL BUCKETS

TOUGH—*for its size!*

BUCKEYE CLIPPER

Let cost-cutting Buckeye Clippers solve your material handling problems. Operators like the smooth, easy way they handle. Owners like the lower operating costs!

½ AND ¾ YARD POWER SHOVELS

BUCKEYE TRENCHERS FILL EVERY NEED!

The Buckeye "160" Trencher, shown above, digs trench from 16" to 42" wide and up to 12'6" deep. Its shiftable boom, maneuverability, and light yet rugged construction make it ideal for contractors on both city and country work. THERE'S A COST-CUTTING BUCKEYE TRENCHER FOR EVERY TRENCHING NEED!

From the shoes on the crawlers to the sheaves on the boom, Buckeye Clipper ½ and ¾ yard shovels are designed and built to take the toughest kind of work day-in and day-out. Production is greater because of in-built speed and ease of handling. Long life with low maintenance costs is assured by the use of top quality, tested and proved materials in every part.

Buckeye Clippers exclusively have "Mevac" metered vacuum power control—similar to that used for years on big highway trucks—which gives instant, measured response and improved operator "feel." Eliminates operator fatigue.

In all, Buckeye Clippers feature 24 points of superior design and construction that mean more production at lower overall cost. They can quickly and easily be converted for any standard front end attachments; have automatic swing brake; 360° swing; swing, crowd and hoist while traveling; non-clogging, self cleaning crawlers; independent chain crowd, etc.

Send for your copy of "Age of the Clippers" and learn how Buckeye Clippers will help you increase production and lower costs.

BUCKEYE TRACTION DITCHER COMPANY

FINDLAY, OHIO

built by **Buckeye**

CONVERTIBLE SHOVELS—BULLDOZERS—ROAD WIDENERS
TRENCHERS—MATERIAL SPREADERS—R-B FINEGRADERS

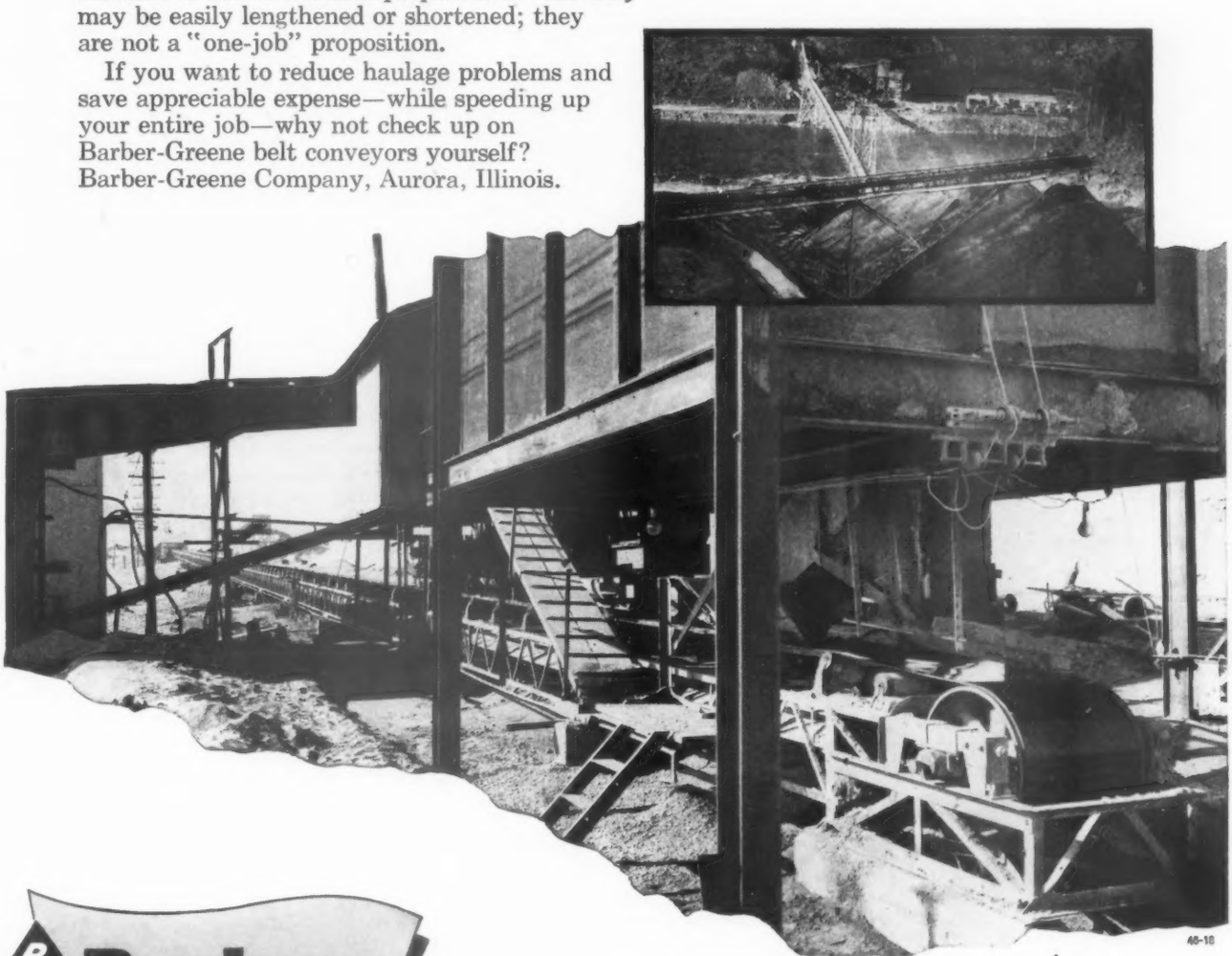
How B-G Belt Conveyors Can Cut Your Hauling Costs!

• If you've bulk materials to haul between your job and stock pile, railroad siding or mixing plant, don't overlook B-G belt conveyors.

These pre-engineered belt conveyors are widely preferred for short hauls uphill and down, across gullies, tracks, rivers and other obstructions. Wherever used, they carry a constant flow of materials at a cost per yard so low that other methods seldom can compete with them successfully.

Barber-Greene belt conveyors are prefabricated, "packaged" units—simply built, easily erected. They often pay for themselves by eliminating the cost of rail or roadbed preparation. And they may be easily lengthened or shortened; they are not a "one-job" proposition.

If you want to reduce haulage problems and save appreciable expense—while speeding up your entire job—why not check up on Barber-Greene belt conveyors yourself? Barber-Greene Company, Aurora, Illinois.



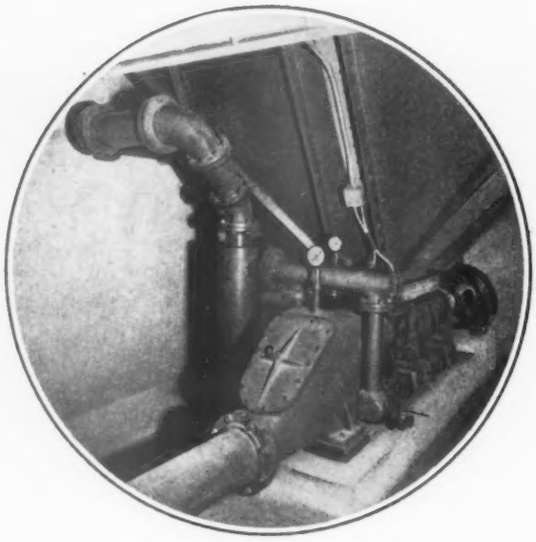
40-10

B-G Barber-Greene CONSTANT FLOW EQUIPMENT

LOADERS • PERMANENT CONVEYORS • DITCHERS • PORTABLE CONVEYORS • FINISHERS • BITUMINOUS PLANTS • COAL MACHINES

There are two practical ways to handle bulk cement . . .

Fuller-Kinyon Remote-Control Unloader unloading cement from box car.



Fuller-Kinyon Stationary Pump installed in pit underneath tracks for unloading cement from hopper-bottom cars.

and both are FULLER-KINYON

The old saying, "There are no two ways about it," doesn't hold good when applied to the unloading and conveying of bulk Portland cement. Because there are two practical ways to do the job, and they're both Fuller-Kinyon. Both systems are efficient and economical of operation; do a quick, clean job of unloading and conveying from box and hopper-bottom cars.

Fuller-Kinyon Remote-Control Unloader—for unloading from box cars, ships and barges. Now used by many ready-mix concrete and asphalt plants, and contractors on highway and dam construction. Any ordinary laborer can operate this equipment with the greatest of ease. Built in different types and sizes for various capacities.

Fuller-Kinyon Stationary Pump—for unloading from hopper-bottom cars. The pump is installed in a pit underneath the tracks. Connection between car and pump is quickly and easily made without dust or loss of material. Built for various capacities to 300 tons per hour.

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FULLER-KINYON, FULLER-FLUXO AND THE AIRVEYOR CONVEYING SYSTEMS . . . ROTARY FEEDERS AND DISCHARGE GATES . . . ROTARY AIR COMPRESSORS AND VACUUM PUMPS . . . AIR-QUENCHING INCLINED-GRATE COOLERS . . . DRY PULVERIZED-MATERIAL COOLER . . . AERATION UNITS . . . MATERIAL-LEVEL INDICATORS . . . MOTION SAFETY SWITCH . . . SLURRY VALVES . . . SAMPLERS

P-78

"Primacord helps keep red ink off our ledgers"

Knowing how to get the most from explosives, equipment, and *time* is one sure way to keep production costs down . . . show more profit.

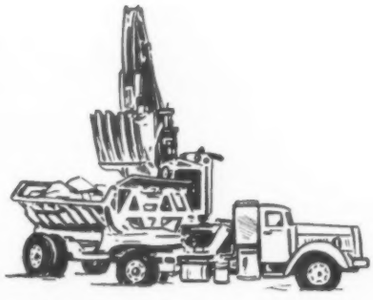
Primacord saves time because it's easy to handle. Packed on spools . . . relatively light in weight . . . it hooks up quickly with square knots and half hitches, can be checked in a minimum of time.

Primacord gets more work out of your explosives because it detonates each cartridge in every hole, acting as a continuous blasting cap throughout the entire load.

Primacord trunk lines should be planned so that the row of holes nearest the face "goes" a split second before succeeding rows, thus relieving burden and producing better fragmentation. Only Primacord — the father of modern blasting — has this built-in uniform time delay quality.

Primacord allows variations in the load to meet conditions of rock strata, and an unlimited number of holes can be shot at one time. Yet no matter how many holes are loaded, stray currents are never a hazard when loading with Primacord — ***the cap goes on last.***

No question about it. With every shot — no matter how small or large — Primacord-Bickford Detonating Fuse, used correctly, increases blasting efficiency . . . *decreases cost.*



Stray Currents are never a hazard when loading with Primacord.

Also
ENSIGN-BICKFORD SAFETY FUSE
Since 1836

P-17

THE ENSIGN-BICKFORD COMPANY • SIMSBURY, CONNECTICUT

PRIMACORD-BICKFORD Detonating • Fuse •

Photograph courtesy of Norton Company, Worcester, Mass.

WICKWIRE SPENCER WIRE CLOTH AIDS NORTON COMPANY MAINTAIN UNIFORM QUALITY

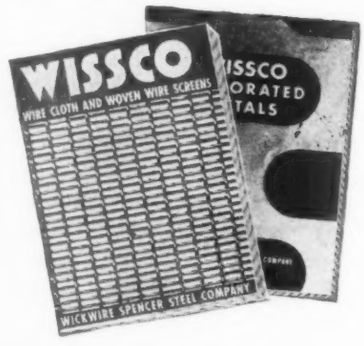
Because offsize grains either fail to do their share of work or scratch and mar the finish, sieving accuracy is essential in the production of abrasives. To maintain the high quality of their abrasives, the Norton Company uses accurate mechanical sizing machines and rigidly checks all screens with master standard grain samples against master standard sieves.

The use of Wickwire Spencer Wire Cloth by the Norton Company is an example of our service to over 100 industries whom we supply with precision fabricated wire cloth in a dozen different weaves. Whether you use wire cloth for screening, filtering, separating, grading, cleaning or processing, you'll find that Wickwire Spencer Wire Cloth will give long, dependable service under chemical action, corrosion, abrasion, moisture or high temperature.

Our engineers will be happy to serve you in the solution of your wire cloth problems. Just write Mechanical Specialties Division, Wickwire Spencer Steel, Sterling St., Clinton, Mass.

FREE BOOKS ON WIRE CLOTH ...PERFORATED METALS

These profusely illustrated reference guides are filled with valuable technical information regarding proper selection and usage of wire cloth and perforated metals. For your copy of either one or both books, address Mechanical Specialties Division, Wickwire Spencer Steel, Sterling St., Clinton, Mass.



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A DIVISION OF THE COLORADO FUEL AND IRON CORPORATION
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Here's the FIRST-NEW-POSTWAR PORTABLE AIR COMPRESSOR

. . . a Sullivan of course!

BIG!

in available power
in air delivered
in bearing areas
in air storage capacity
in fuel storage capacity
in cooling capacity
in dependability

SMALL!

in length
in width
in height
in weight

Sullivan presents this modern, streamlined, sturdy and most efficient line of portable air compressors, the *NEW* WK-80 SERIES. It's the first portable air compressor to incorporate the NEW materials and efficiency-producing mechanical improvements developed during the war. You have never seen so much air-power, efficiency, portability, low maintenance and reliability packed so efficiently in so little space. With Sullivan patented, direct-concentric valves, two-stage compression, streamlined air passages and the "ECONO-MISER" load control that regulates air supply to demand, the WK-80 sets new high standards of compressor efficiency. Its sturdy "Bulkhead" body construction, full force-feed lubrication, "Cascade" oil cooling and low piston speeds . . . assure lowest maintenance. Add to all these features its minimum overall dimensions and you have a portable compressor that's as modern as this minute — one that will give you real pride of ownership. For all secondary drilling jobs in your quarry, you can profitably power your hand-held or wagon drills with one of these new Sullivan portables from 105 to 630 c. f. m. Sullivan Division, Joy Manufacturing Company, Michigan City, Indiana. In Canada: Canadian Sullivan Machinery Co., Ltd., Dundas, Ontario.

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REALLY PORTABLE!

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Genuine Jeffrey Replacement Parts

Yes, these are reproductions, but every one is made to the same high standard as the original. Pick Jeffrey parts to keep production rolling.

THE JEFFREY MANUFACTURING COMPANY

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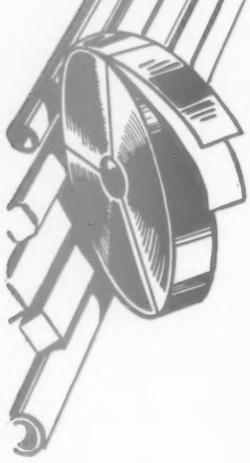
BRASS, BRONZE AND COPPER... Rod, Bar, Sheet, Strip, pipe, tubing, and wire in Production Quantities.

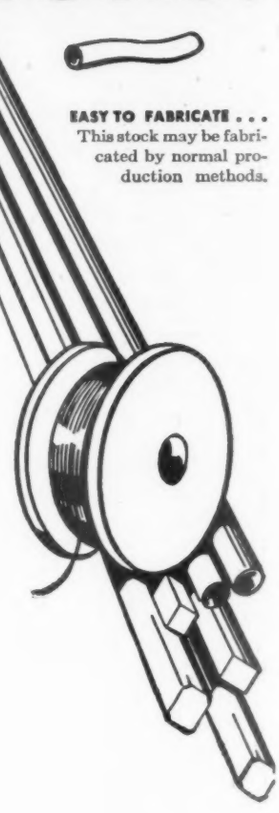


GOVERNMENT-OWNED SURPLUS STOCK

in many standard and non-standard grades, finishes, sizes and specifications AVAILABLE NOW in production quantities

—and new surplus declarations are being made daily.

EASY TO FABRICATE... This stock may be fabricated by normal production methods.



HOW TO PURCHASE

1. Estimate, for any convenient period, your production needs in each specification, finish, gauge, etc.
2. Write, wire or phone that information to your nearest War Assets Corporation office* below. We will advise you of the location and condition of the stock you need, estimate possible delivery dates, quote prices and help arrange credit.
3. When satisfactory arrangements have been made, we will start shipments.

***WAR ASSETS CORPORATION** is a Reconstruction Finance Corporation subsidiary. When checking telephone and other directories, simply look up RFC.

VETERANS OF WORLD WAR II: To help you in purchasing surplus property from War Assets Corporation, a veterans' unit has been established in each of our Regional Offices listed below.

A DISPOSAL AGENCY DESIGNATED BY THE SURPLUS PROPERTY ADMINISTRATION for Surplus Producers' and Capital Goods, Aircraft and Plants formerly handled by Reconstruction Finance Corporation . . . and for Surplus Consumer Goods formerly handled by United States Department of Commerce.

WAR ASSETS CORPORATION

(A SUBSIDIARY OF RECONSTRUCTION FINANCE CORPORATION)

RFC OFFICES (INCLUDING FORMER DEPARTMENT OF COMMERCE REGIONAL SURPLUS PROPERTY OFFICES) LOCATED AT: Atlanta • Boston • Chicago • Denver • Kansas City, Mo. • New York • Philadelphia • San Francisco • Seattle • OTHER RFC SURPLUS PROPERTY OFFICES LOCATED AT: Birmingham • Charlotte • Cleveland • Dallas • Detroit • Helena • Houston • Jacksonville • Little Rock • Los Angeles • Louisville • Minneapolis • Nashville • New Orleans • Oklahoma City • Omaha • Portland, Ore. • Richmond • St. Louis • Salt Lake City • San Antonio • Spokane • OTHER FORMER DEPARTMENT OF COMMERCE REGIONAL SURPLUS PROPERTY OFFICES LOCATED AT: Cincinnati and Fort Worth

157-4

N·B·M SILVER BABBITT FOR HEAVY PRESSURE

By alloying silver with lead, we produced a babbitt metal that remains stable under high speeds and heavy loads. During many years of gruelling war-time service it has proved its qualities:

- High Anti-frictional Qualities
- Ease of Bonding
- Retention of Hardness at High Temperatures
- Resistance to Squeezing Out
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- Ease of Handling
- Resistance to Corrosion

Give N-B-M Silver Babbitt your toughest test. It will stand up to it.

N·B·M

NATIONAL BEARING

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AMERICAN Brake Shoe COMPANY

PLANTS IN: ST. LOUIS, MO. • PITTSBURGH, PA. • MEADVILLE, PA. • JERSEY CITY, N. J. • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL.

KVS...THE MEASURE

MACHINERY...for Producers of Sand, Gravel, Crushed Stone, Lime and Cement

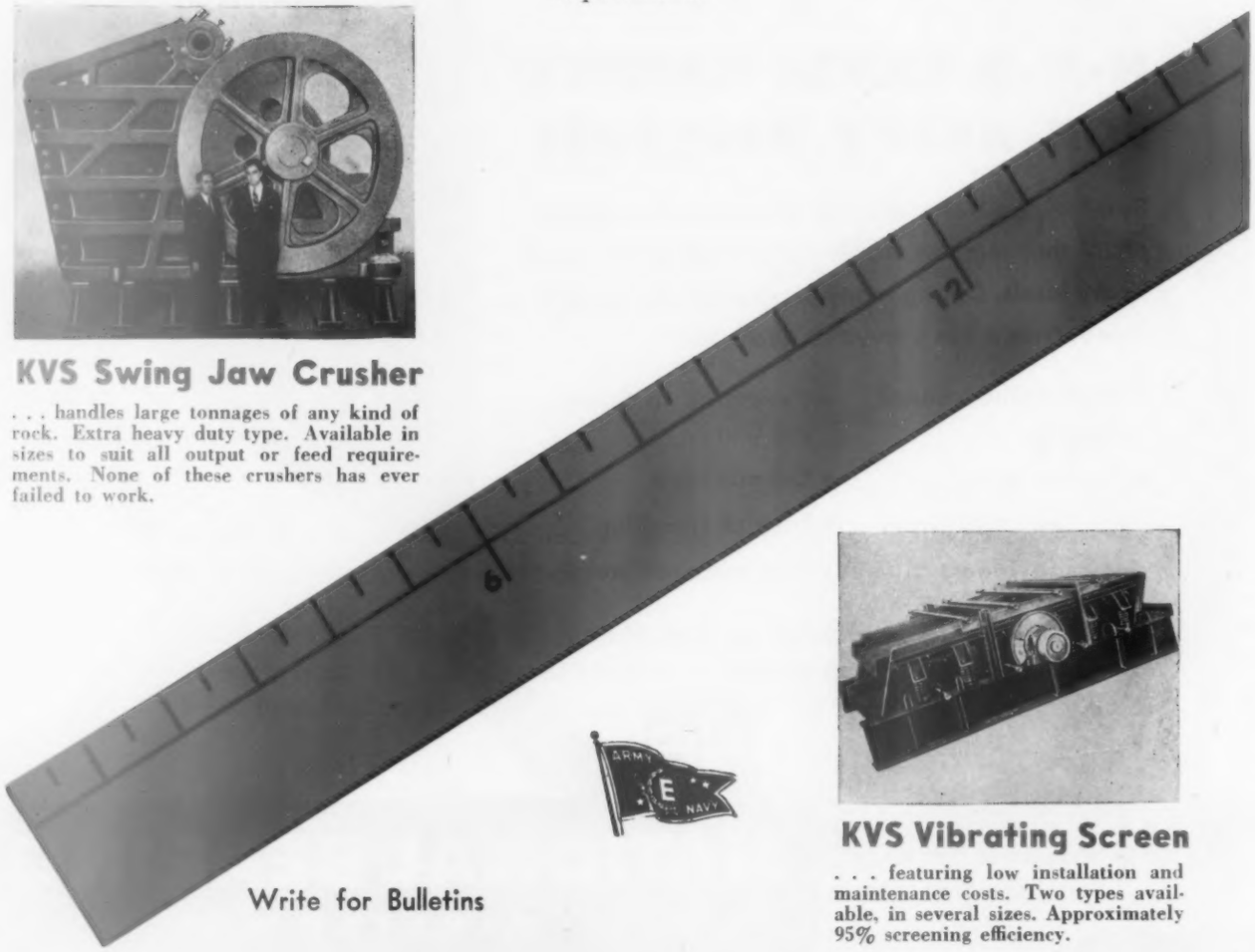
Production and cost sheets furnish "all the answers" concerning the relative merits of various types of plant equipment.

On the basis of established records, KVS Machines . . . for handling and processing non-metallic minerals . . . provide a standard "yardstick" for performance, reliability and operating economy.

Consult the highly skilled KVS engineering staff if your present production methods do not "measure up" to modern requirements.

KVS Swing Jaw Crusher

. . . handles large tonnages of any kind of rock. Extra heavy duty type. Available in sizes to suit all output or feed requirements. None of these crushers has ever failed to work.



Write for Bulletins

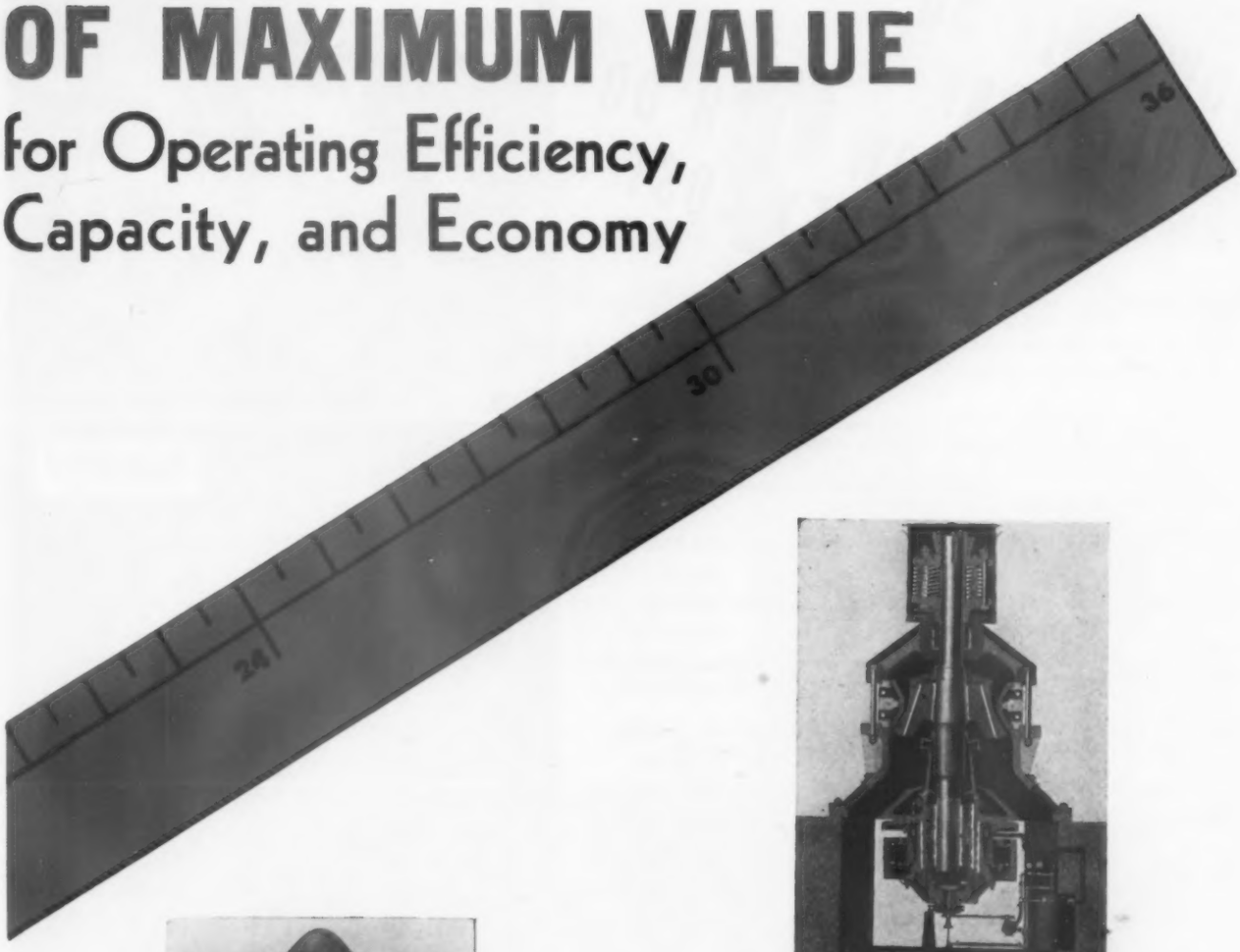
KVS Vibrating Screen

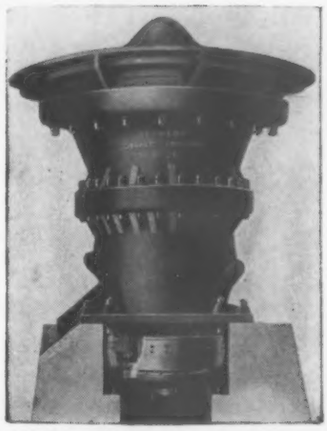
. . . featuring low installation and maintenance costs. Two types available, in several sizes. Approximately 95% screening efficiency.

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

OF MAXIMUM VALUE

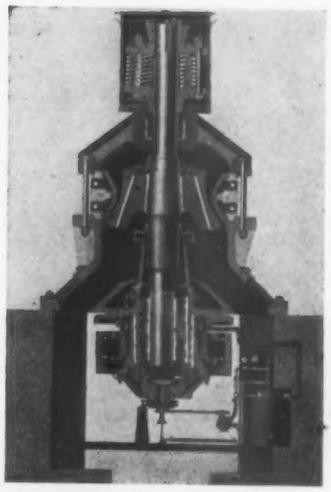
for Operating Efficiency, Capacity, and Economy





KVS Gyratory Short Shaft Standard Crusher

. . . for primary reduction. Force-feed lubrication. Easy accessibility. Synchronous motor built in the pulley. Shows large power saving over geared type crusher.



KVS Ball Bearing Gearless Crusher

. . . for fine reduction. Low head type. Synchronous motor built in the pulley applies all power directly to crushing. Reversible concaves or grinding ring. Gives 100% more wear than any other crusher.

KVS manufactures a complete line of equipment for crushing, pulverizing, washing, screening, and conveying materials.

Representatives in all principal cities in the United States and foreign countries, including Ejido 7-503, Mexico, D.F.

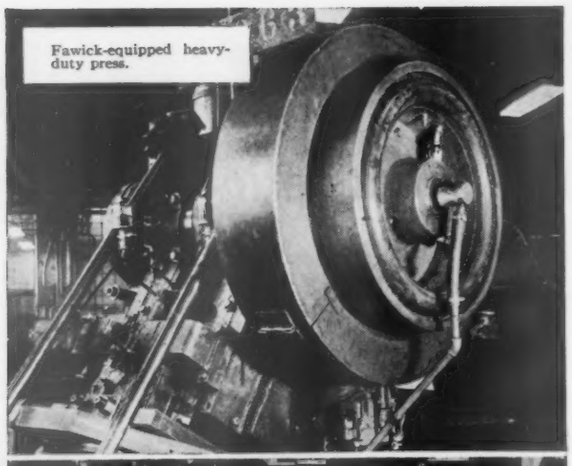
2 PARK AVENUE • NEW YORK 16, N. Y. FACTORY: DANVILLE, PA.

HOW WELL DO THEY WORK? HOW MUCH DO THEY COST?

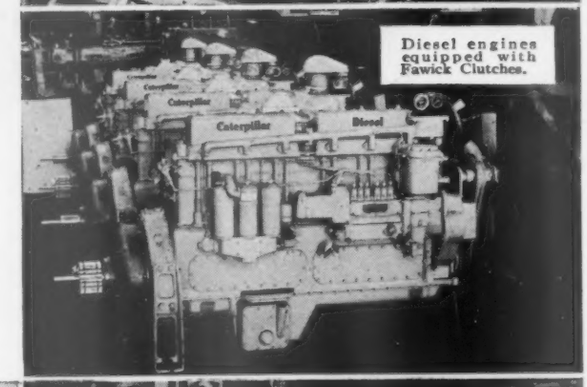
Both of these important questions about Clutches for heavy-duty drives are answered—*in your favor*—by Fawick Airflex Clutches.

1. They absorb shock and vibration, and transmit power, through a cushion of air—just like your car rides on its tires.
2. They have no moving parts to wear or get out of adjustment—no springs, toggles, arms or levers.
3. They require no lubrication—maintenance costs are low.
4. They provide uniform clutch engagement under all loads, at all speeds.
5. Performance and economy have been proved—on thousands of navy ships and on hundreds of types of industrial applications.

Let our Engineering Department give you details—on clutches, slip clutches, brakes, flexible couplings and power take-offs.

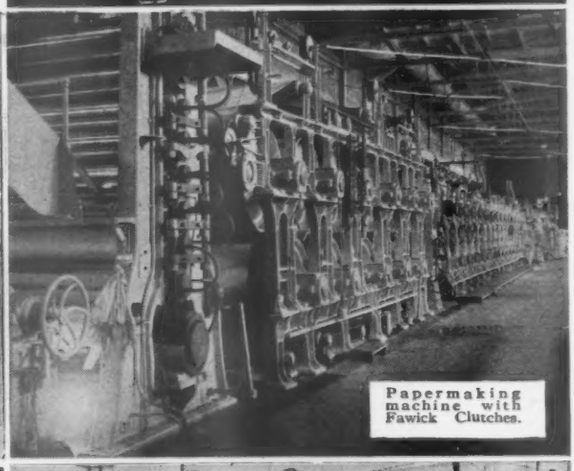


Fawick-equipped heavy-duty press.

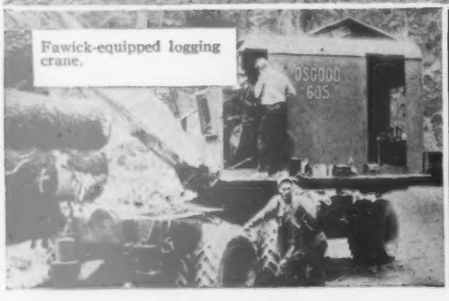


Diesel engines equipped with Fawick Clutches.

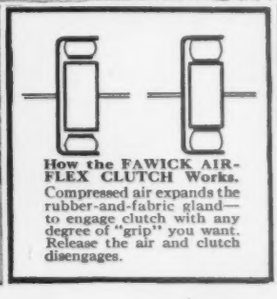
Fawick Clutches save time and money on big dredges.



Papermaking machine with Fawick Clutches.



Fawick-equipped logging crane.



How the FAWICK AIR-FLEX CLUTCH Works. Compressed air expands the rubber-and-fabric gland—to engage clutch with any degree of "grip" you want. Release the air and clutch disengages.

11 Fawick Clutches on modern oil field drilling rig.

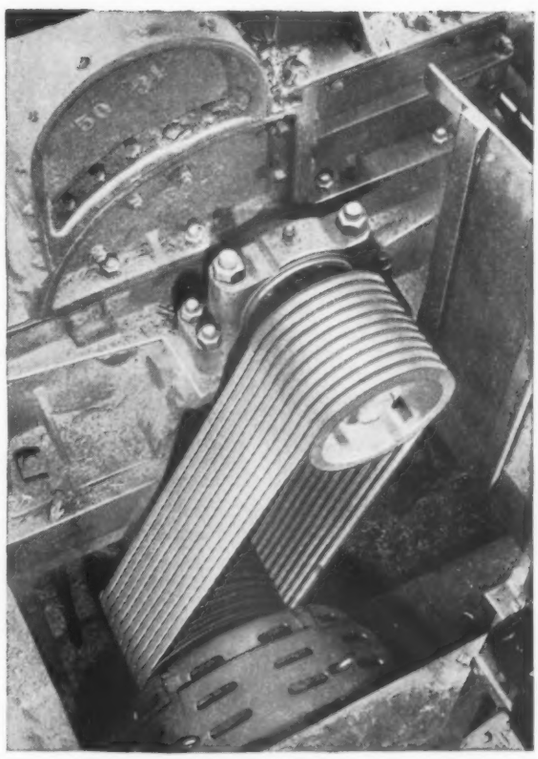
FAWICK *Airflex* CLUTCH

FAWICK AIRFLEX CO., INC. • 9919 Clinton Road, Cleveland 11, Ohio

In Canada, Reynold-Coventry Ltd., Montreal, Toronto, Vancouver — In Britain, Crofts Engineers, Ltd., Bradford, England

The Reason for this Fact is worth knowing

Your GATES VULCO ROPES are Today Making Performance Records NEVER EQUALED Before!



No V-belts built by *anyone* before the war had anywhere near the strength and durability that was found necessary on U. S. Army tanks, tractors and self-propelled big guns in combat service. Gates developed these greatly superior V-belts for Army use—and here is why this fact is important to industrial users of V-belts:—

Here is the reason

Every improvement developed by Gates for U. S. Combat Units — and many later improvements, also—have been added, day by day, to the quality of the Standard Gates Vulco Ropes which have been delivered to you.

That is why, *long before the war was over,* you were getting in your Standard Gates Vulco Ropes a product built to far higher service standards than any V-belts ever built by anyone before the war.

And that is not all of the story. Through continuing *specialized* research, the service qualities of these superior Gates Vulco Ropes have been still further improved as all of Gates facilities and energies have been returned to the service of industry.

These are the simple reasons why the standard Gates Vulco Ropes you are getting today are far and away the best V-belts Gates has ever delivered to you.

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Engineering Offices and Jobber Stocks in All Large Industrial Centers

Gates

THE MARK OF SPECIALIZED RESEARCH

464

GATES VULCO ROPE DRIVES

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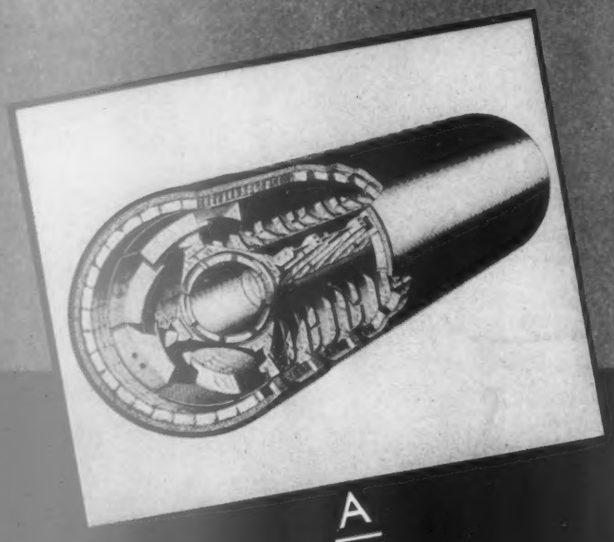
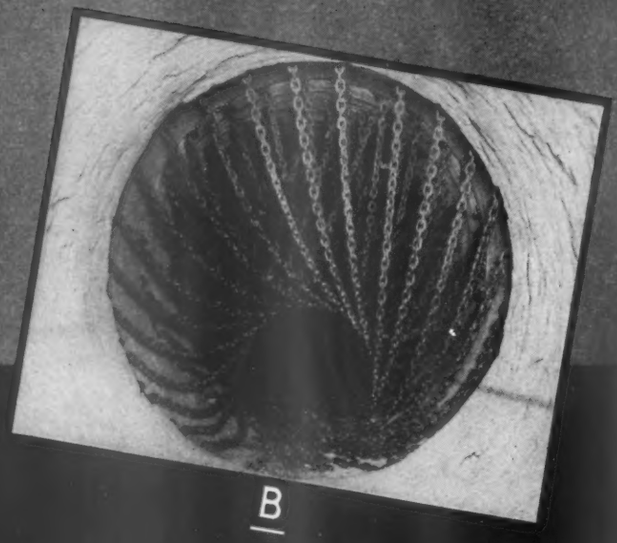
PORTLAND 9, ORE., 333 N.W. 5th Ave. DALLAS 2, TEXAS, 1710 N. Market St. SAN FRANCISCO 3, CAL., 170 Ninth St.

3 WAYS TO SAVE FUEL

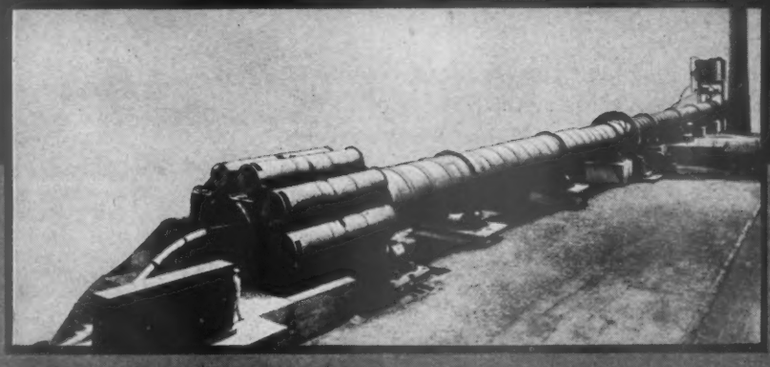


A



B

C



A
Heat Exchangers for Dry Kilns

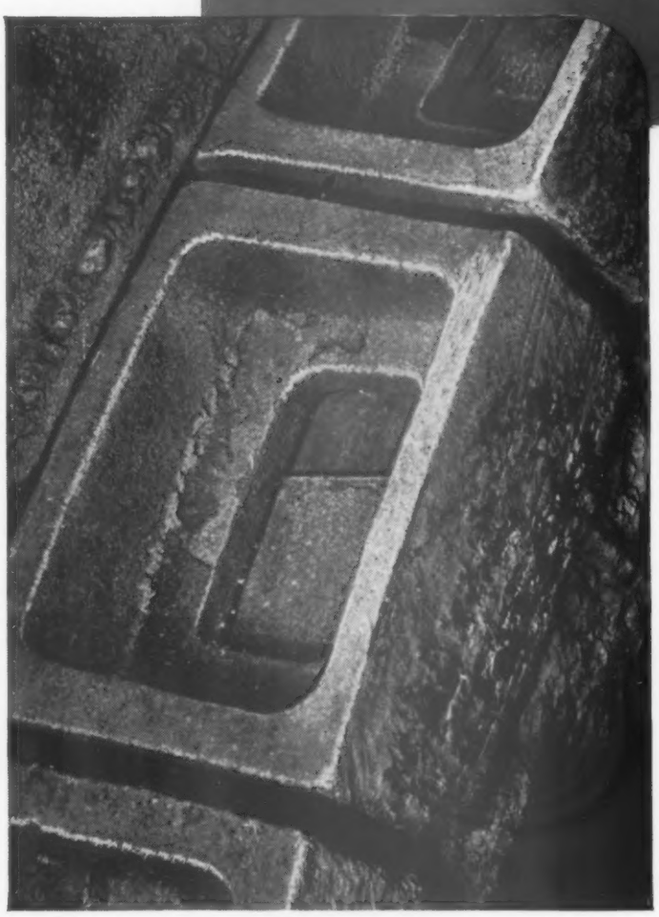
B
Chain Systems for Wet Kilns

C
Unax Cooler Integral with Rotary Kiln

F. L. SMIDTH & CO.

11 WEST 42ND STREET — ENGINEERS AND MACHINERY MANUFACTURERS — NEW YORK, N. Y.

What B & W knows about Nose Ring Castings . . . CAN SAVE YOU MONEY



Outlasted Others 4 to 1

Unretouched photo (above) of B&W Nose Ring Castings on rotary kiln, still in service after three and one-half years of severe use. Previous castings on same kiln failed after approximately nine months' service. Other installations have served nearly five years and are still going strong.

FOR five years, cement plants having serious difficulty with the discharge ends of kilns were the subject of an intensive study by B&W engineers. Many of the problems revealed by these field studies were solved by the development of B&W High-Alloy Nose Ring Castings, which are now performing satisfactorily in a number of prominent cement plants. B&W Nose Ring Castings can help you reduce kiln maintenance and avoid costly shutdowns for several reasons:

❶ Reinforcing ribs, in compression against kiln shell, keep castings straight and true, and prolong brick life. Belling out and warping of kiln mouth, due to expansion of castings, overcome by improved design and method of mounting castings.

❷ Special alloy of 25% Chromium—20% Nickel, developed by B&W for nose ring service, has superior oxidation-resistance and low rate of permanent growth, giving castings longer service life.

❸ Initial installation costs are lower than for conventional designs because B&W Castings are much smaller and lighter in weight. B&W has pattern equipment for most standard sizes—which usually means quicker delivery and elimination of pattern charges.

Let us tell you more about the advantages of B&W Nose Ring Castings.

S-70

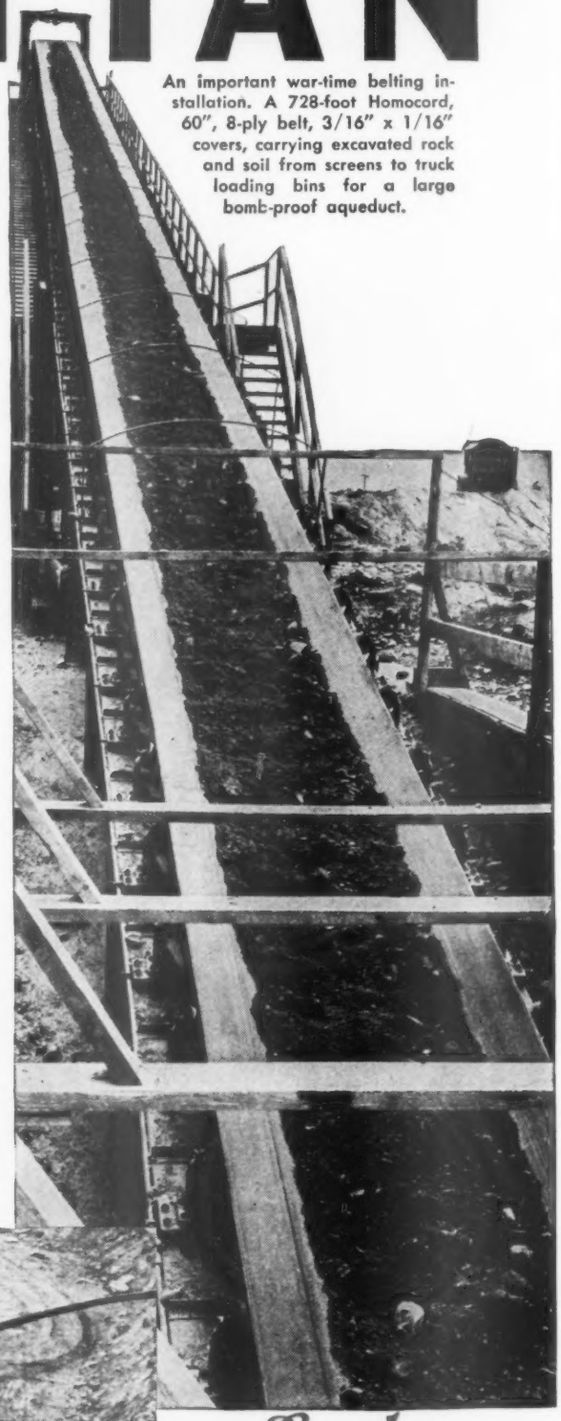
Water-Tube Boilers, for Stationary Power Plants, for Marine Service . . . Water-Cooled Furnaces . . . Superheaters . . . Economizers . . . Air Heaters . . . Pulverized-Coal Equipment . . . Chain-Grate Stokers . . . Oil, Gas and Multifuel Burners . . . Seamless and Welded Tubes and Pipe . . . Refractories . . . Process Equipment.

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO.
85 LIBERTY STREET, NEW YORK 6, N.Y.

MANHATTAN

HOMOCORD CONVEYOR BELTS



An important war-time belting installation. A 728-foot Homocord, 60", 8-ply belt, 3/16" x 1/16" covers, carrying excavated rock and soil from screens to truck loading bins for a large bomb-proof aqueduct.

Hauling Heavier Loads—Longer . . . on prominent material moving jobs

Homocord Strength Member construction was designed by Manhattan belting engineers only for conveyor belt use. Strong longitudinal and cross Homocords are perfectly patterned for low inelastic stretch and natural troughing for full loading and with strength to hold fasteners.

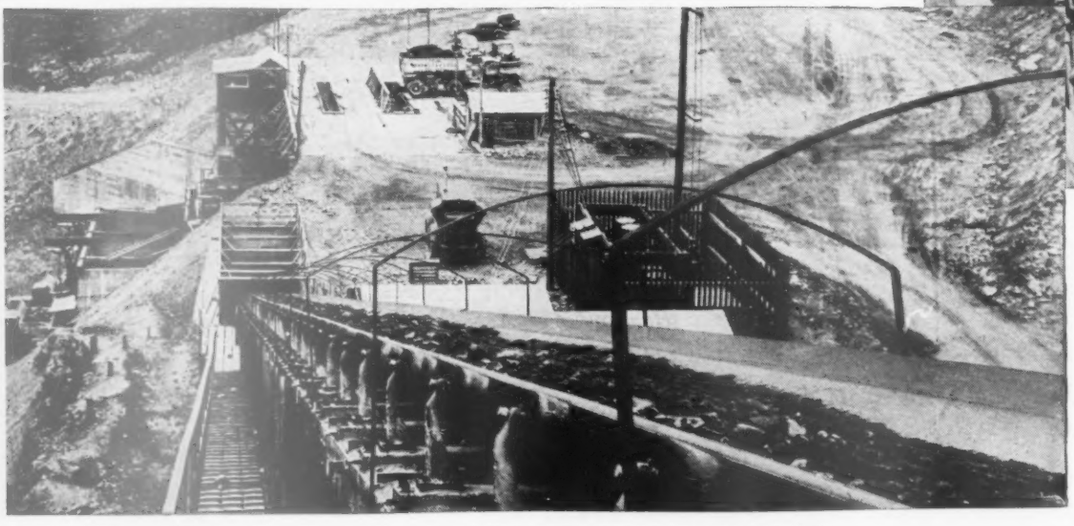
During vulcanization, Flexlastics are forced INTO and AROUND each cord. The Homocords in both directions, sealed by Flexlastics, have a resilient, rolling contact with each other that gives the "Rippling Muscle" body a high degree of recovery to absorb the heaviest feed impact load, as well as to withstand flexing around end, tripper and drive pulleys and in the troughing idlers. The Homocords are so completely impregnated with Flexlastics that moisture cannot enter the body. Mildew cannot start. Nevertheless, Homocord Belts are mildew-proofed throughout for additional protection.

On your job it may be possible to move more material with fewer shut-downs—to make more money on your belt hauls.

8 Advantages

- Complete bonding of every member into a homogeneous structure
- Holds metal fasteners
- Lateral flexibility permits perfect troughing, accurate training, reduces fatigue of flexing at bend in troughing idlers
- Resists destructive action of continuous or heavy impact feeding
- Cushion Homocord body and low inelastic stretch reduce wear and tear of top cover
- Homocord body reduces hazard of punctures
- Mildew-Proof, Homocords so completely encased in Flexlastics, moisture not admitted, mildew cannot start
- Longer life, lower cost per ton

The term FLEXLASTICS is an exclusive Manhattan trade mark. Only Manhattan can make FLEXLASTICS



Condor PRODUCTS

Air, Steam, Water Hose	Elevator Belts
Suction Hose	Pulley Lagging
Sand Suction Hose	Chute Lining
Dredge Sleeves	Launder Lining
Cement Loading Hose	Slings
Transmission Belting	Packing
V-Belts	Molded Products
Conveyor Belts	Abrasive Cutting Wheels
	Surfacing Wheels

RAYBESTOS-MANHATTAN, INC.

MANHATTAN RUBBER DIVISION

EXECUTIVE OFFICES AND FACTORIES — PASSAIC, NEW JERSEY

Economy...Safety...Continuous Operation

ALL CALL FOR TOUGHER CABLES

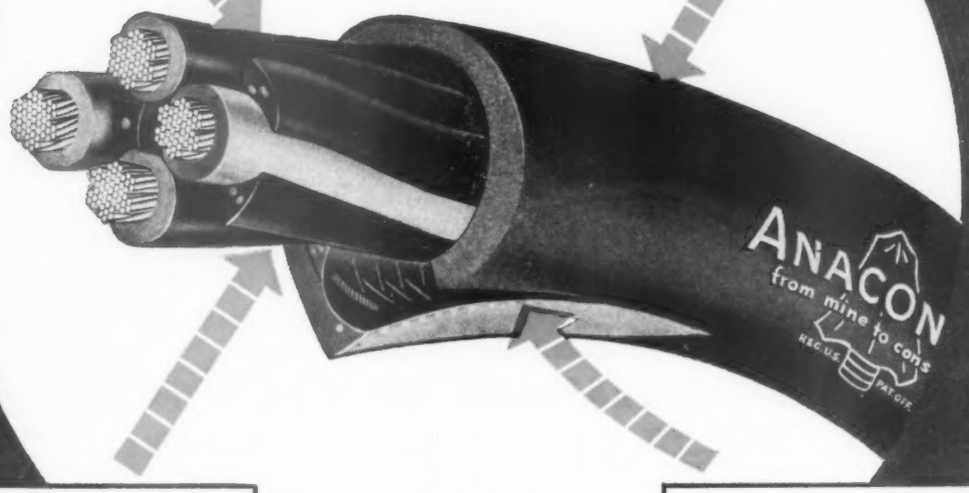
Here's how to get them — Look to Anaconda for the sound engineering service and painstaking construction that assures long, trouble-free service — Heavy Duty Securityflex — it's the answer to your cable problems. Anaconda Wire & Cable Company, Subsidiary of Anaconda Copper Mining Company, 25 Broadway, New York 4, N. Y. Sales Offices in Principal Cities. 46309

NO KINKING

Anaconda engineered construction eliminates kinking — a nuisance not found in Anaconda Securityflex.

ABRASION AND OIL RESISTANCE

All Anaconda Securityflex cables have a tough *Neoprene Jacket* for maximum abrasion and oil resistance.



FIRE RESISTANCE

The specially compounded Neoprene Jacket, plus heat-resistant insulation, makes Securityflex the safest cable possible.

NO LOOSE JACKETS

Special bonding process eliminates cable failures from loose jackets.

ANACONDA *Securityflex** **CABLE**

ANACONDA
from mine to consumer

*Reg. U. S. Pat. Off.

Use KOTAL Master Mixes for Bituminous Surfaces All Year 'Round

It's easy

It's easy to keep bituminous surfaces in condition all the year 'round with KOTAL Mixes. These cold mixes, tested and proven in more than six years of hard use, produce tough, durable surfaces and solid repairs that resist stripping and stand up indefinitely. Prepared by advanced scientific methods, using high-grade cutback asphalts or road tars, KOTAL Mixes have these unique features:

EIGHT WORKING FEATURES OF KOTAL MASTER MIXES

EASY TO USE. Quickly mixed, ready to lay. No preheating or drying.
STABILITY. Cure quickly and permanently. Do not shift, ravel or pick up. Open sooner to traffic.

WORKABILITY. Do not adhere to equipment. Work easily.
LONG-TERM STOCK PILES. Can be stock-piled for many months without losing workability.

SAVE TIME. Quickly made stock piles ready for immediate use without frequent fresh mixes.
SAVE LABOR. Actual road records prove fewer labor hours required.

SAVE MONEY. Savings in time and labor mean economies in road costs.
EXTEND PAVING SEASON. All-weather workability permits more months of operation.

IT'S THE KOTAL PROCESS THAT MAKES THE DIFFERENCE

Write for your copy of booklet which tells the story of KOTAL MIXES.

We will also send you the name of your nearest supplier.

MASTER MIXES KOTAL

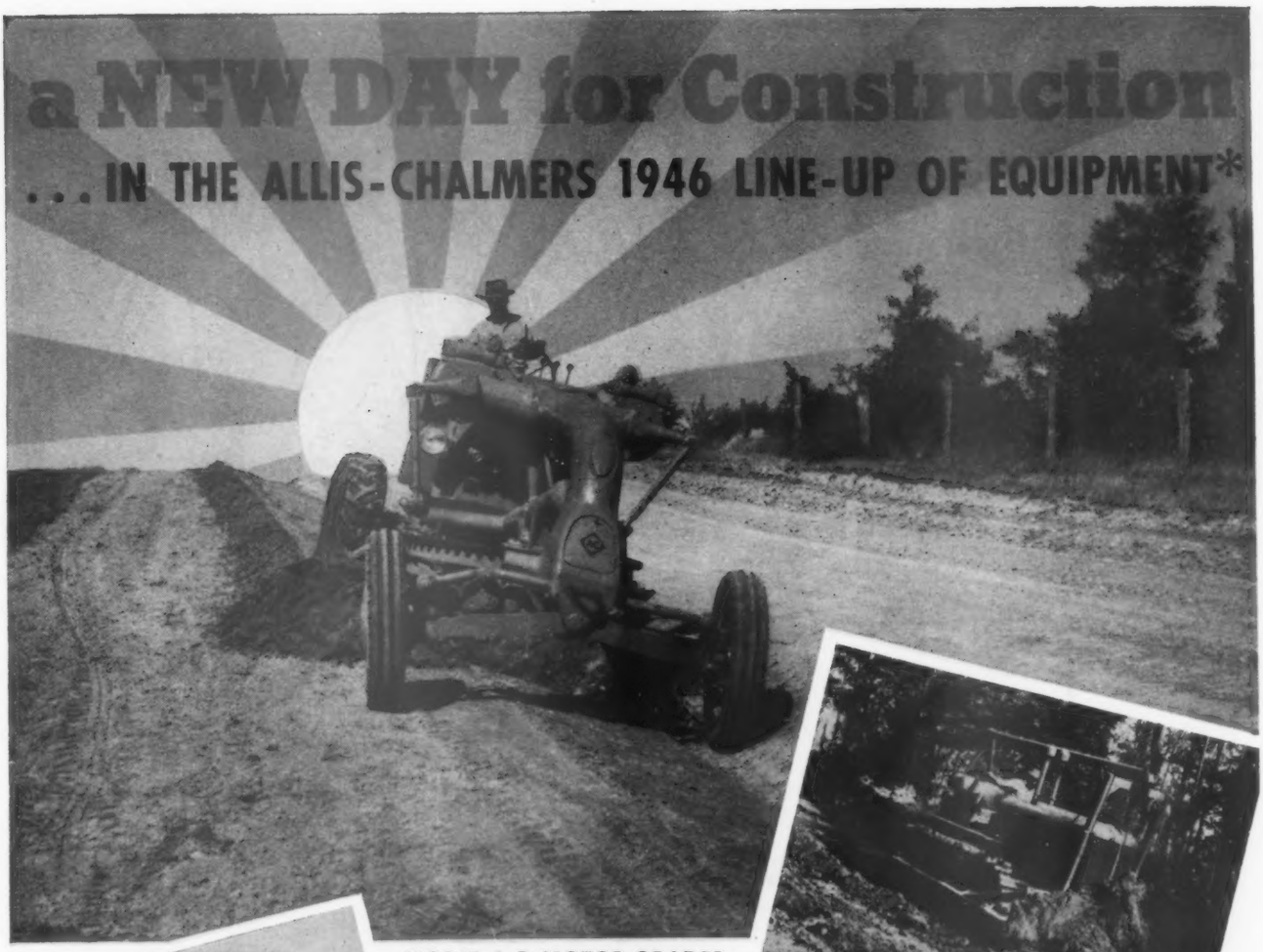
KOTAL COMPANY ★ 52 Vanderbilt Ave. ★ New York 17

KOTAL Master Mixes

The Advanced All-Weather Aid in Building Better Roads

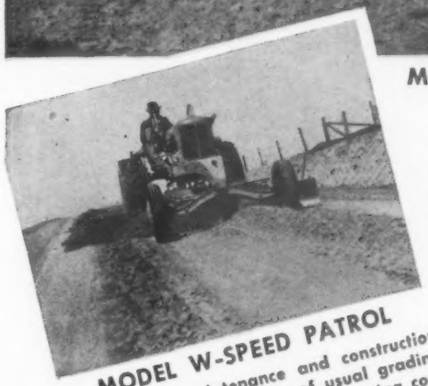
a NEW DAY for Construction

. . . IN THE ALLIS-CHALMERS 1946 LINE-UP OF EQUIPMENT*



2-CYCLE DIESEL TRACTORS
— now a choice of four models, ranging from 60 to 132 drawbar h.p. — HD-7, HD-10, HD-14, HD-14C (Torque Converter Tractor) — with matched allied equipment — cable and hydraulic bulldozers and scrapers . . . snow plows, winches, sheepfoot rollers, rippers.

MODEL A-D MOTOR GRADER
— 75 Diesel h.p. engine . . . more traction, more clearance . . . a full range of blade positions for handling complete grading — slopes, ditches, surface.



MODEL W-SPEED PATROL
— for light maintenance and construction . . . performs at fraction of usual grading cost—low original cost, low operating cost.

Up-to-the-minute in design!
Modern in performance!

A new high in productivity . .
a new ease in operation . .
a new low in grading cost.

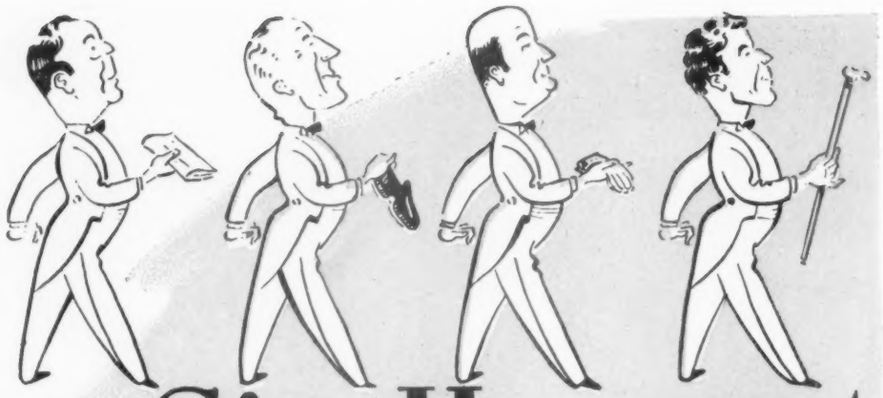
It's a New Day for construction men . . . with Allis-Chalmers power!

MODEL I-B WHEEL TRACTOR
— the ideal, economical unit for countless pulling and pushing jobs—hauling work in quarries, sweeping blacktop, bulldozing loose materials.

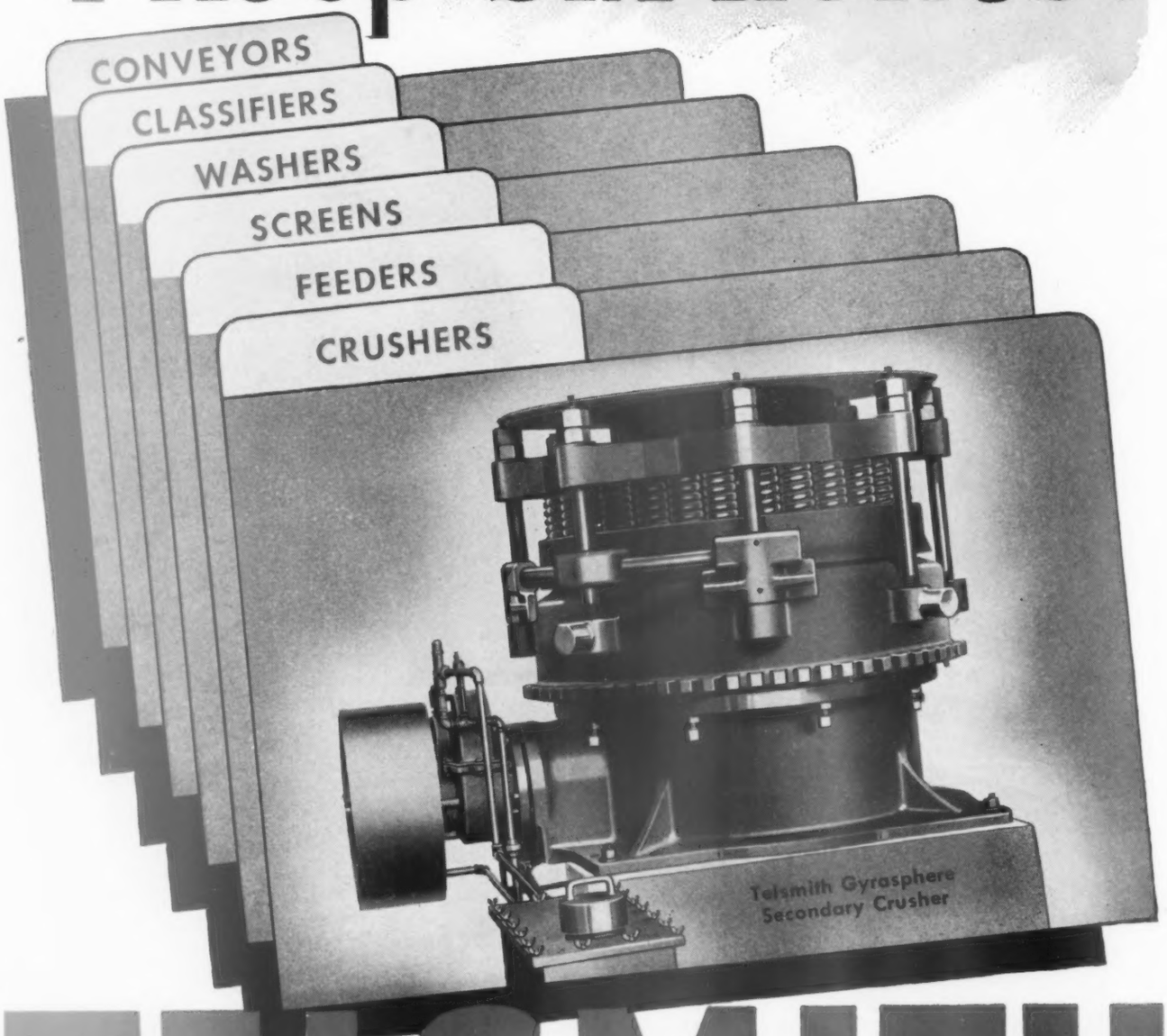
POWER UNITS
— for driving crushers, conveyors, compressors, screens, shovels, draglines, pumps and other equipment. Available with various accessories to fit the application. 5 sizes. Choice of fuels.

* MORE MACHINES ARE TO BE ADDED . . *Watch for Announcements!*

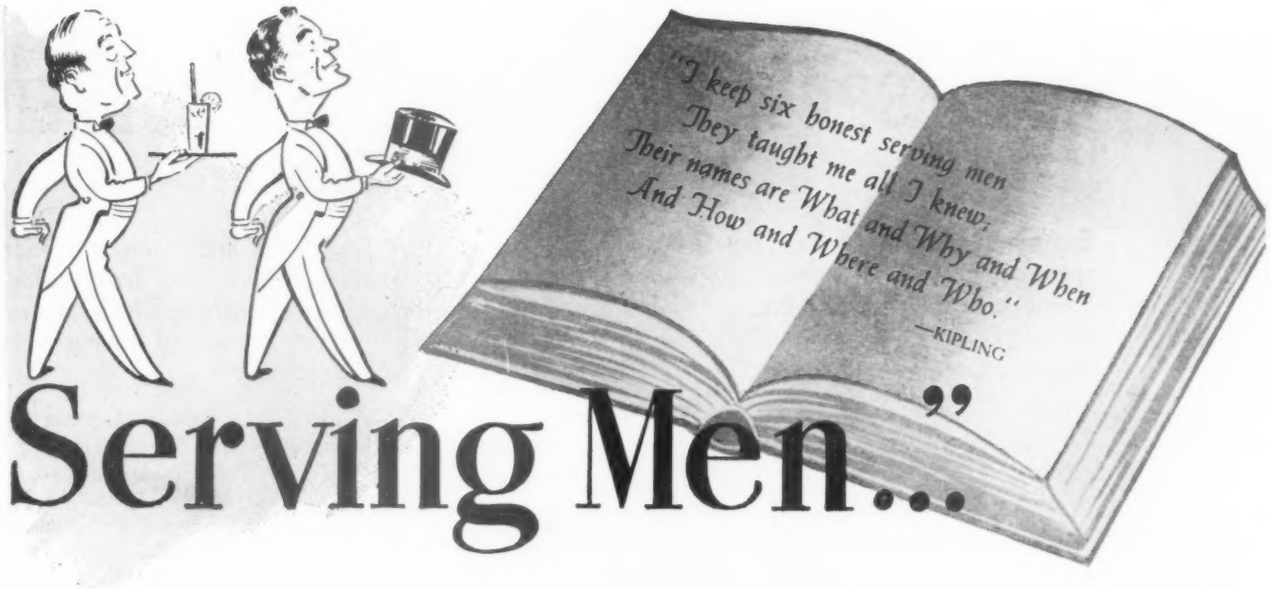
ALLIS-CHALMERS
TRACTOR DIVISION • MILWAUKEE 1, U. S. A.



"I Keep Six Honest



TELSMITH


"I keep six honest serving men
They taught me all I knew;
Their names are What and Why and When
And How and Where and Who."
—KIPLING

Serving Men..."

WHAT *makes a Telsmith-equipped rock crushing or sand and gravel plant* different *and* better? Telsmith engineers *scientifically* design, build and equip your plant. It is co-ordinated and balanced to give you—finer sizing . . . improved products . . . lowest costs.

HOW *far does Telsmith Service go?* All the way! Telsmith engineers study the deposit, ground topography, etc.; note available power and shipping facilities; consider the products, their market and the competition. Your plant's size, design, and requirements are then determined on the basis of all these facts.

WHY *are Telsmith engineers* without bias *in recommending equipment?* Telsmith designs and builds *all types* of crushers and an equally complete line of feeders, screens, washers, classifiers, conveyors, elevators, etc., in a wide and varied range of types and sizes best suited to your particular conditions and needs.

WHERE *do you save?* Telsmith plants—laid out and equipped to save power and labor—have fewer mechanical units. Investment is low. Consistently large output and exceptional product quality, combined with low maintenance and operating costs, insure your profits.

WHEN *did Telsmith service originate?* Forty years ago. That's why Telsmith engineers *know how* to select the most economical method and right equipment for each operation; to design and build highly individualized plants that run smoothly and profitably.

WHO *is responsible for results?* Telsmith . . . and only Telsmith! You deal with but one concern . . . thoroughly competent and willing to take complete and undivided responsibility . . . and financially able to make good the Telsmith guarantee of results.

S-2

Consult Telsmith engineers . . . Get Bulletin E-15

SMITH ENGINEERING WORKS, 504 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

51 East 42nd St. New York 17, N.Y.
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713 Commercial Trust Bldg. Philadelphia 2, Pa.
247 Third St. Cambridge 42, Mass.
Boehck Eqpt. Co. Milwaukee 3, Wis.
Mines Eng. & Eqpt. Co. San Francisco 4—Los Angeles 14
Brandeis M. & S. Co. Louisville 8, Ky.
Rish Equipment Co. Charleston 22 & Clarksburg, W. Va.
Rish Equipment Co. Roanoke 7 & Richmond, Va.
North Carolina Eqpt. Co. Raleigh & Charlotte, N.C.
Wilson-Weesner-Wilkinson Co. Knoxville 8 and Nashville 6, Tenn.

Equipment

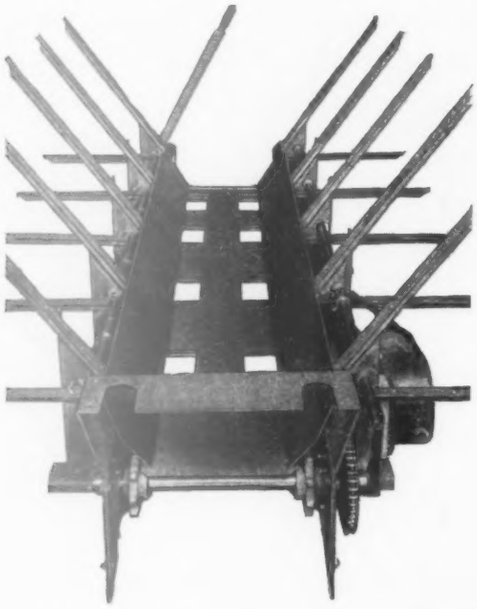
your SPREADING PROBLEMS SOLVED

with "THE NEW LEADER"

Summer or Winter—Wet or Dry there is now a NEW LEADER lime marl and rock spreader to fit your particular problem. With the new electrically welded heavy steel frame plus the wooden hopper you will have a spreader expressly designed to give you many years of hard dependable service. If you are interested in increasing your profits get in touch with us immediately. Don't wait—write or call today!

This is the 11 ft. wide bottom spreader mounted on a long wheel base Ford truck. Standard sizes are 9, 11, 13, and 15 feet. We have found through research that the hopper should be constructed of wood. This eliminates material from freezing to the sides which is so common on the all steel spreaders during cold weather. Thus with THE NEW LEADER you are assured of being able to operate in any weather and still have an even flow and distribution of material.

Here is the electrically welded heavy all steel frame. Notice the sliding doors open changing THE NEW LEADER into a rock spreader. Within your reach from the cab is a single lever which controls the opening and closing of all the sliding doors in the spreader.



With the extremely wide bottom and the steep sloping sides you are further assured of getting a more even and accurate spread of material. The gear boxes driving the distributor discs are equipped with steel cut gears and ball bearings running in oil in a dust-proof oil-tight gear case. Steel sprockets and heavy duty chains are used.

MANUFACTURERS OF THE WORLD'S MOST COMPLETE LINE OF SPREADERS

HIGHWAY EQUIPMENT CO., INC.

CEDAR RAPIDS, IOWA

INTERNATIONAL

This emblem identifies the nation's largest company-owned truck-service organization—International Branches—and International Truck Dealers everywhere.

5 Reasons Why
INTERNATIONAL SERVICE
Can Help You Meet Rising Truck Operating Costs

1. Mechanics who furnish International Service are *truck* mechanics—specialists in truck service.

2. They are trained in International shop methods.

3. They are kept constantly informed of all improvements in maintenance and service practices.

4. They use International-approved equipment for analysis and testing.

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International Truck Service is supplied by a national network of International Truck Dealers and by International Branches—the nation's largest company-owned truck-service organization. It is available for trucks of all makes and models.

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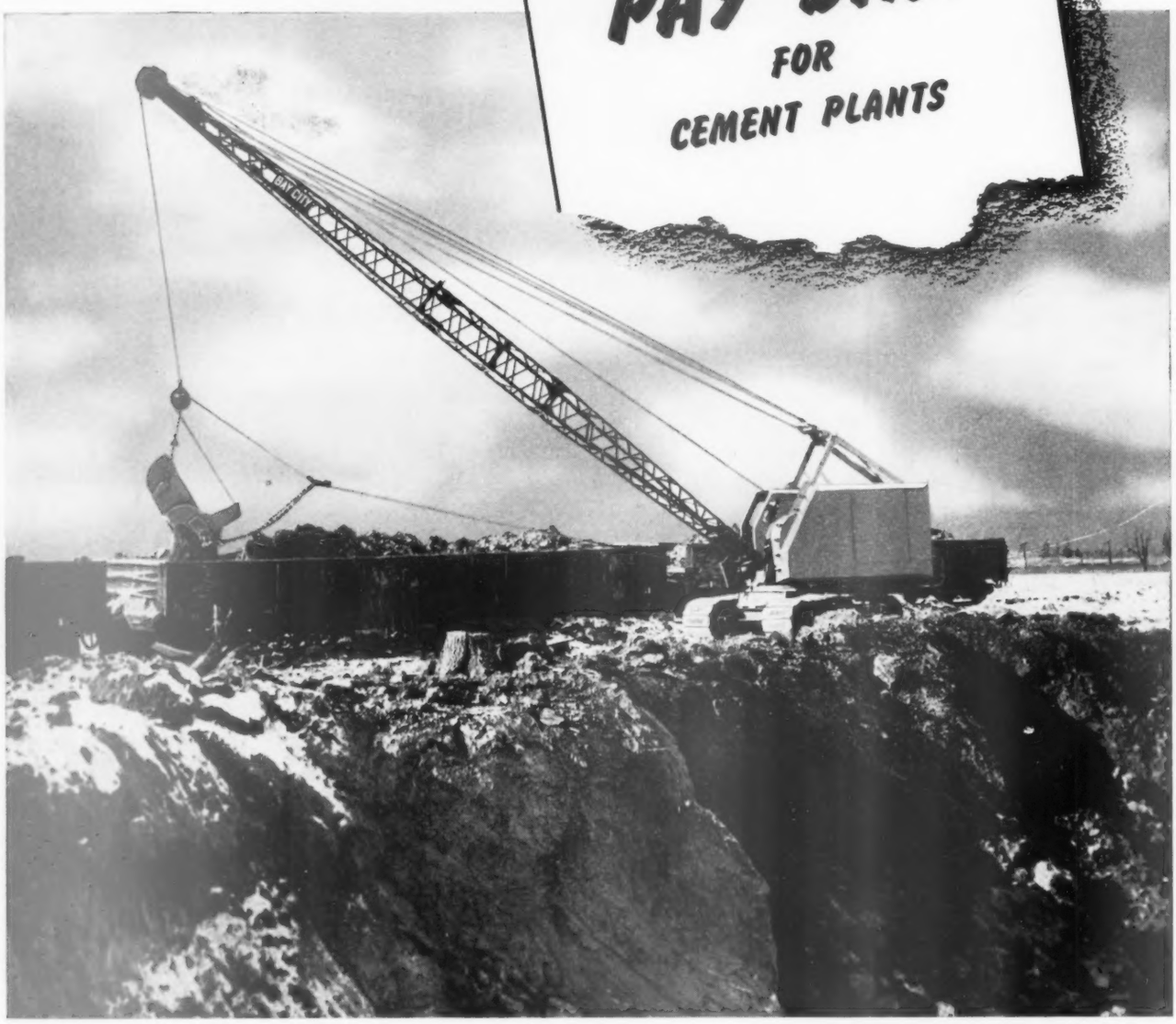

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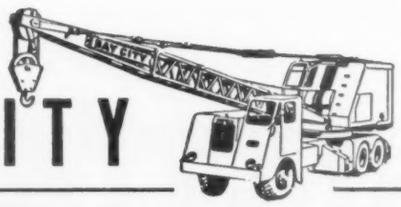

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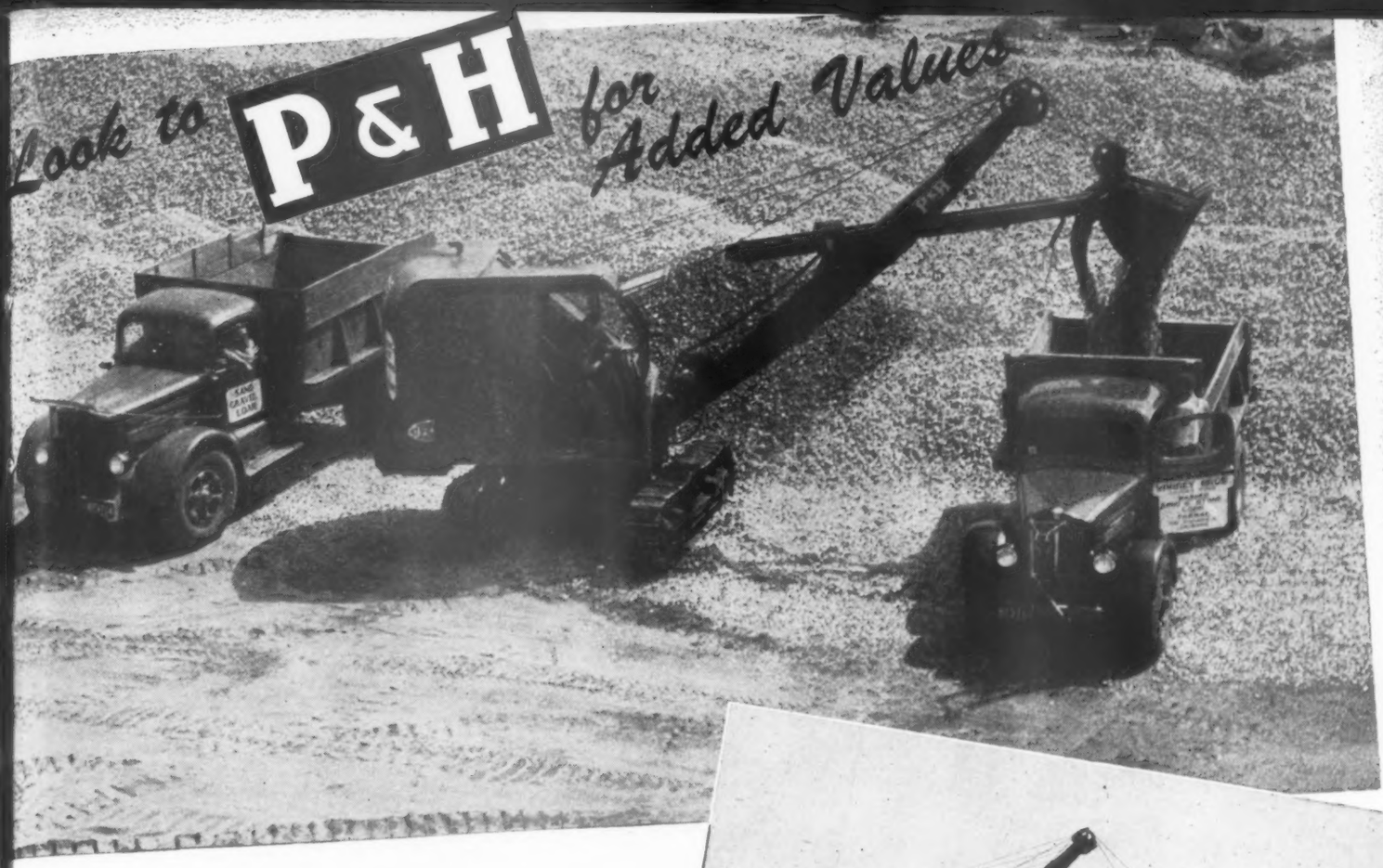

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PIT AND QUARRY

April, 1946
Vol. 38 No. 10

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CONTENTS

Editorial: Relieving the Housing Shortage.... 56
News of the Industry.... 59
Washington News Letter.... 64
Men of the Industry.... 65
New Plant Processes Tripoli.... 66
A.I.M.E. Stresses Mining Methods.... 69
Method for Determining Damage to Shaft Current.... 71
Aggregate-Bituminous Plant Meets New Demands.... 73
Iowa Agricultural Limestone Assn. Meeting.... 75
Recent Developments in Drilling Blast Holes.... 77
1,000,000 Tons of Phosphate Per Year.... 80
Millard Modernizes Haulage, Crushing Systems.... 82
Additional N.C.S.A. Photographs.... 83
The Lime Plant Operator.... 85

The Concrete Manufacturer

News of the Industry.... 119
Develop Quake-Proof Design Data.... 120
26th Annual N.C.M.A. Convention.... 123
How Our Company Solved a Labor Problem.... 128
Air Entrainment, Research Stressed at 42nd Annual A.C.I. Convention.... 131

Personal Mention.... 88
Obituaries.... 90
Legal Decisions.... 92
Traffic News.... 99
New Machinery and Equipment.... 103
Trade Notes.... 107
Trade Literature.... 109
Index to Advertisers.... 154

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EDITORIAL

Relieving the Housing Shortage

OF great significance to those sections of the nonmetallic-mineral industries engaged in the production of the raw materials for building are the pressures that have been and continue to be exerted on members of Congress for the defeat of measures designed to encourage the construction of houses in large numbers and in accordance with some plan with long-range objectives. The Wagner-Ellender-Taft General Housing bill has been the target for attacks that have increased in number and intensity in recent months. Opposition to its provisions has come from so many different pressure groups serving special interests that those who support it in the belief that it offers a constructive national housing program have become fearful that favorable action may be effectively blocked by those who place their individual and group interests above the general welfare.

The lack of adequate housing facilities is laying a heavy toll on the nation's economy. Large numbers of people have been immobilized by it and, as consequence, normal peace-time production is being hampered by the inability of workers, released by the closing or reduced activity of war plants, to move to areas where there is growing need for their services and where their special skills can be most effectively utilized. It has been estimated that more than 16,000,000 people are living doubled up and with no visible prospect of finding separate housing accommodations for themselves.

The needs of returned veterans call for some 3,000,000 houses now, and within a decade at least four times that many homes will be required. Without some practical housing program, conceived with due regard to the needs of the country as a whole, it will be impossible to satisfy more than a small fraction of present requirements. Such a program need not, and surely will not, be free from features objectionable to some business interests. The problem facing the country, however, is not that of finding a flawless plan but of uniting on one that will provide the greatest benefits for the largest number of people with the least waste of time, money and materials.

The country's housing shortage, as was pointed out by Wilson W. Wyatt, National Housing Expediter and Administrator of the National Housing Agency, in a recent radio address, is the result of more than 15 years of insufficient building prior to the war, a period in which the peak year's record of 900,000 homes built in 1925 fell to some 90,000 in 1933. It has been accentuated by the return of 8,000,000 men from the armed forces and the proposed demobilization of some 4,500,000 more by next summer.

The Veterans' Emergency Housing Program was set up to provide 2,700,000 homes in two years as a first step in an effort to furnish homes for all those who want and need them. The Wyatt program would require almost $1,000,000,000 in Federal aid and $500,000,000 for additional mortgage insurance. Of the larger amount, $600,000,000 would be needed for premium payments to secure increased production of conventional and new types of building materials above existing levels, and approximately $100,000,000 would be used to stimulate technical research into new materials and construction methods by private research groups and to absorb certain developmental costs involved in devising such materials or methods.

The use of premium payments with the effect of subsidies, for the establishment of the housing industry on a basis that will enable it to meet the country's long-range housing needs for the first time, has been likened by Mr. Wyatt to the use of government subsidies in the development of our railroads, steamship lines and aviation industry in their early years and until they could operate profitably without outside assistance. They would be employed to help submarginal material producers who can not operate profitably under present price ceilings, and thus aid in breaking those bottlenecks that are responsible for present material scarcities.

STANDING in the way of the adoption of any constructive plan for meeting the country's housing needs are organized groups whose members believe that their profit outlook would be darkened if the plan were to be successfully applied to the solution of the housing problem. Building-and-loan agencies, real-estate boards and organizations of apartment-building owners are determined, if they can, to prevent the adoption of any workable plan, and with that end in view they have worked diligently to discredit all efforts to find a way out of the present difficulty.

Aside from their natural desire to protect and advance their business interests, producers of building materials want to contribute to the growing welfare of the American people. By taking a long-range view of the housing problem, by supporting measures and policies that are designed to produce long-term benefits to the national economy, instead of lending the weight of their approval to the wishes of small groups that clamor for quick and exhorbitant personal gains, producers and builders, too, can do the most for themselves at the same time that they further the general good.

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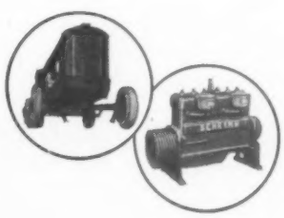

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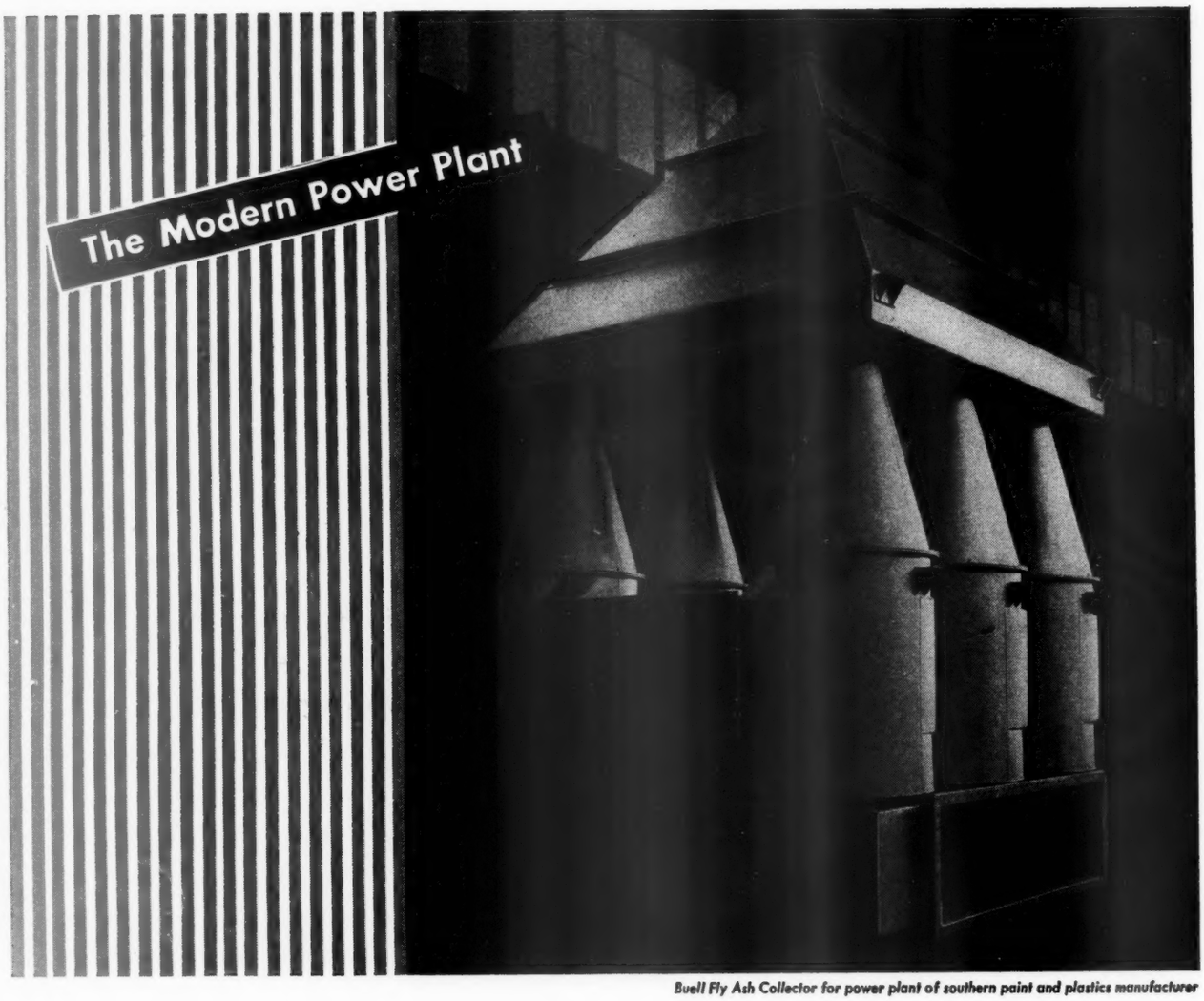

Buell Fly Ash Collector for power plant of southern paint and plastics manufacturer

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In modern power plants throughout America, Buell van Tongeren Fly Ash Collectors have a reputation for "high efficiency, low maintenance, long life."

Many Buell installations have been in continuous operation for five or more years at no expense of maintenance or repair. Pictured above is a Buell Collector that was installed in the plant of a Southern paint and plastics manufacturer, for the collection of fly ash from a bark burner. It has been in operation since May 1941.

Buell serves many divisions of industry. Among them for example is one of the country's largest steel companies, a U. S. Navy Yard, a famous brewery, and a leading electric light and power company. In fact, Buell installations cover a cross-section of industrial America.

Executives and engineers are invited to write for specific Buell Fly Ash Collector information, together with a copy of its comprehensive bulletin—"The van Tongeren System of Industrial Dust Recovery."

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CHICAGO APRIL, 1946

A.I.M.E. Diamond Jubilee To Be Celebrated This Fall At Three-Day Meeting

Plans are being formulated for the 75th anniversary of the American Institute of Mining and Metallurgical Engineers, Inc., which is to be observed at a three-day meeting of the institute, September 16 to 18. The event will take place at the Waldorf-Astoria Hotel in New York City.

In addition to the four major sessions, a surprise excursion has been planned. Since the scope of the meeting is to be on an international scale, invitations will go to many scientific organizations and institutions in foreign countries.

National Safety Council To Ask Public for Funds

During the month of May the National Safety Council will launch a nation-wide fund-raising campaign aimed at winning public support for a vast accident-prevention program. The appeal will be the first ever made to the American people by the 33-year-old organization.

Startling figures such as these will be quoted—261,608 lives lost and 651,911 persons wounded during American participation in all theaters of war from 1941 to 1945, as contrasted with 355,000 lives lost and 1,250,000 permanently injured on the home front during the same period.

The official insigne of the drive will be a green cross, which will be widely reproduced in the press, motion pictures and on posters.

Waco-Tex Material Co. Erects New Mixing Plant

At Brownwood, Tex., the asphalt division of the Waco-Tex Material Co. is completing the erection of a new mixing plant and installing general equipment. The site of the plant is near the Santa Fe rock crusher at a mountain limestone quarry. This addition to the firm's facilities is the second step in a long-range expansion program. Two years ago a topping-stone plant was installed at a cost of about $20,000. The new buildings will represent an additional investment of more than $30,000. It is estimated that the plant will have a capacity of 50 tons an hour.

To the present time, the crusher has been supplying ballast for the Santa Fe railroad at the rate of 10 cars daily; in addition, six or eight carloads of topping are shipped out each day.

Kaiser to Participate in President's Housing Plan

Henry J. Kaiser has declared that he will build in California at least 10,000 of the new homes called for in President Truman's building program.

Mr. Kaiser stated that he would beat the current scarcity of building materials by employing substitutes such as aluminum, glass, wood-concrete, gypsum board and various types of plastics. He asserted that, by using these *ersatz* materials, he can build homes which will sell for $5,000 or $6,000.

Certain-teed Honors 42 Who Served for 25 Years

The Certain-teed Products Corp. received 42 veteran employees into its 25 Year Club at a dinner in the Hotel Touraine at Buffalo, N. Y. They were given watches in recognition for their service. Paul E. Fischer of Chicago, Certain-teed vice-president in charge of production, made the presentations. Employees of the Buffalo, Niagara Falls and Akron, N. Y., plants were honored.

W. S. Dickey Clay Mfg. Co. To Have $1,000,000 Plant

Plans for a $1,000,000 plant were revealed recently by the W. S. Dickey Clay Manufacturing Co. of Pittsburg, Kan. The new buildings will replace the 43-year-old plant now being used. H. P. Wilhelmsen, president, announced that the new facilities will provide 165,000 square feet of floor space, including 90,000 square feet of drying room.

Purchase of the business and equipment of the Dawson Quarries near Somerset, Ky., has been announced by Harold Strunk. This quarry, formerly owned by R. R. Dawson, and another at Tateville, Ky., will be operated under the name of the Strunk Construction Co. Mr. Strunk plans to install equipment valued at $100,000 at the Tateville plant.

Housing Expediters Named For 7 Regions of U. S. To Help Vets Find Homes

The appointment of seven regional housing expediters to work with community leaders in securing maximum production of homes for veterans was announced by Wilson W. Wyatt, national housing expediter. The appointees, who are at present regional representatives of the N.H.A., are John M. Dobbs, Boston; C. S. Ascher, New York; C. J. Horan, Chicago; C. N. Walker, Atlanta; J. P. Tufts, Dallas, Tex.; P. L. Wright, San Francisco; and G. W. Coplen, Seattle. Mr. Wyatt also appointed Neil Dalton as deputy national housing expediter.

The principal responsibilities of the appointees will be to aid in analyzing local veterans' housing needs, to estimate production facilities, to aid in setting local production goals and to bring all Federal Government resources to bear on the problem of realizing these goals.

Brig. Gen. Beverly C. Dunn, new War Department division engineer, told an audience in Cincinnati that the U. S. engineers flood control program calls for $23,000,000 for 1946 and $29,000,000 for 1947.

Coming Events

April 3-5, 1946—Chicago. Annual meeting, Midwest Power Conference, Palmer House.

May 15, 16, 1946—Hot Springs, Va. Annual meeting, National Industrial Sand Association, The Homestead.

June 24-28, 1946—Buffalo. Annual meeting, American Society for Testing Materials and exhibit of testing apparatus and related equipment.

September 16-18, 1946—New York. 75th Anniversary of American Institute of Mining and Metallurgical Engineers, Inc., Waldorf-Astoria Hotel.

October 7, 1946—Chicago. 34th National Safety Congress and Exposition, Stevens Hotel.

F.H.A. to Sponsor Home Remodeling Drive Designed to Aid Vets

The Federal Housing Administration has launched a broad co-operative program to stimulate interest in home remodeling as a means of securing additional housing for veterans, according to an announcement made by Commissioner Raymond M. Foley.

Leading material manufacturers are being asked to indicate how the F.H.A. can assist them in participating in the "Remodel for Veterans" program. Property owners may obtain loans up to $5,000 for terms up to seven years. When eligible for F.H.A. insurance, these loans cover properties in designated "war housing" areas. Occupancy priority is given veterans of World War II.

Topeka Firm Buys L.C.M. For Use in Sand Business

Unusual interest was evoked at Topeka, Kan., when Otto Kuehne, Jr., operator of the Kansas Sand Co., purchased a 20-ton L.C.M. (landing craft, mechanized) built for service in the Pacific. The craft, which arrived in Topeka on a railroad flatcar, will be used on the Kaw River as a combination tugboat, portable dredge and drydock, as the company's needs require. The vessel is capable of carrying a cargo of 60,000 pounds.

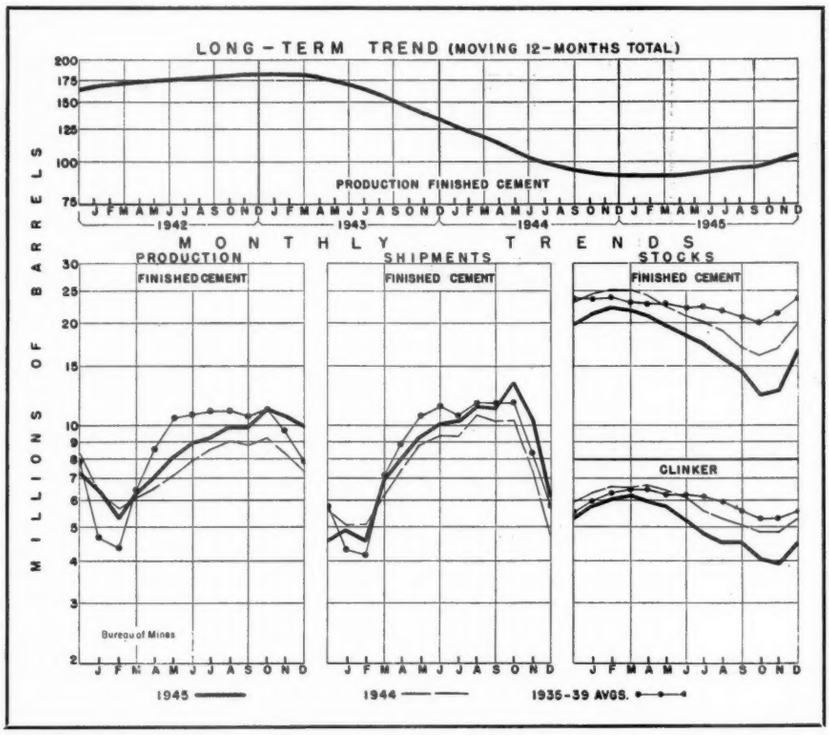
Mr. Kuehne has recently perfected a series of four cement mixes called Tru-Mix Dry Products. The materials used are dried in a rotary kiln at 2,000 degrees F. to remove all but a negligible part of the moisture and to eliminate the tendency of the mix to harden or deteriorate. All four mixes have been subjected to extensive tests over a period of two years.

Iowa State Tests Show Agstone Has Improved

Experiments at the testing laboratory of Iowa State College at Ames, Ia., have indicated that agricultural limestone has improved substantially during the last two years. According to B. J. Firkins, who is in charge of the limestone testing laboratory, the agstone is finer and the calcium carbonate equivalent is 7.5 per cent. higher than formerly. The samples tested, numbering more than 1,000, showed a purity of 90.5 per cent., as compared to an 83 per cent. test in 1943.

Employers' Co-operation Asked for Veterans' Jobs

An appeal from Perry Faulkner, chief of the Veterans Employment Service of the United States Employment Service, and Robert C. Goodwin, U.S.E.S. director, has been directed to employers, urging them to work out programs for hiring veterans and for assisting each to find the right job. To this end, the local offices of the U.S.E.S. are distributing an employers' guide. This booklet contains a list of aids which employers may obtain from the U.S.E.S. and a description of the services offered to them and to veterans.



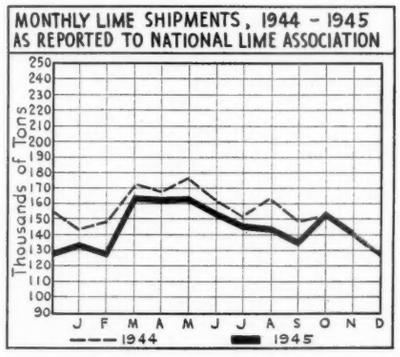
Production of 9,772,000 barrels of cement in December, 1945, reported to the U. S. Bureau of Mines, was 32 per cent. above that reported for December, 1944. Although the December, 1945, total represents a decrease of 12 per cent. from the October peak of 11,104,000 barrels, it follows the normal seasonal trend. Mill shipments of 6,100,000 barrels were 33 per cent. above those reported for the corresponding month of the previous year. Mill stocks on December 31, 1945, of 16,423,000 barrels were 17 per cent. below the December, 1944, figure. However, they represent an increase of 29 per cent. over the November, 1945, total. Clinker production of 10,363,000 barrels in December, 1945, was 32 per cent. above that reported in the corresponding month of the previous year. Operating activity for December, 1945, also shows that an increase as 48 per cent. of capacity was utilized, an increase of 12 per cent. over that reported for December, 1944. Demand for cement, as indicated by mill shipments, by districts, was higher than in December, 1944, in all districts except California and Oregon-Washington, which show decreases, respectively, of 12 and 5 per cent. The increases range from 16 per cent. in Virginia-Georgia-Florida-Louisiana to 93 per cent. in Ohio.

Pittsburgh Plate Glass Adopts New Pension Plan

A broad new retirement plan for 3,200 salaried employees of the Pittsburgh Plate Glass Company was announced recently by Harry B. Higgins, president of the firm and its subsidiaries, the Columbia Cement Division and the Columbia Chemical Division, makers of limestone, cement and allied products.

Under the new arrangement, salaried employees 30 years of age or over, who have completed at least three years' service with the company, but who have not reached the retirement age of 65, will be eligible for the retirement benefit.

Drilling, blasting, crushing, screening, and electrification are only a few of the many subjects completely covered in the 24 chapters in the Pit and Quarry Handbook.



According to data collected by the National Lime Association, 51 companies in December, 1945, shipped 129,718 tons of lime (83,667 quicklime; 46,051 hydrate). Reporting companies represent 42.7 per cent. of the association members' total capacity of record. Based on Pit and Quarry's estimates for the remainder of the industry, the total shipments for the month by all plants were approximately 334,000 tons. Shipments of lime by users for December, 1945, were:

Use	Quicklime (tons)	Hydrate (tons)
Agricultural	730	4,011
Building	6,695	21,028
Chemical	76,242	21,012
Total	83,667	46,051

Veterans' Rating System Not to Be Affected by New Rulings—Wyatt

Priorities for scarce building materials issued under the present Veterans Preference Rating System will remain valid and will not be affected by any change in regulations under the Veterans Emergency Housing Program, National Housing Expediter Wilson W. Wyatt has declared.

Home builders were assured that all HH preference ratings which have been issued and are currently being issued will be honored by suppliers for 11 building materials now in extremely short supply.

There is no intention to check construction of homes progressing with priority assistance; and the orders being developed to tighten controls over materials in accordance with the emergency program will not prevent the completion of priority housing under construction, Mr. Wyatt said.

Priority Regulation 33, as it is now constituted, authorizes the extension of HH ratings to individual veterans or builders who agree to give veterans preference in the sale or rental of new housing not to cost more than $10,000, including land improvements, nor rent for more than $80 a month.

Private Home Building Increases in February

The amount of money spent in February for privately financed residential construction was only about half of the monthly average needed to provide the volume of housing called for in the Wyatt Housing Program, according to the Construction Division of the Department of Commerce.

Privately financed construction of all types in February totaled $462,000,000, an increase of 11 per cent. from January, with residential construction (exclusive of farm dwellings) rising 17 per cent. from the January level to $175,000,000 in February.

Pointing out that the normal seasonal trend is a decline since February is a short month, the Construction Division said that the contra-seasonal rise was encouraging, particularly in the case of residential construction.

The volume of private non-residential building in February also showed an increase over January (11 per cent.), but privately financed public utility activity declined slightly (3½ per cent.).

New construction of all types was valued at $547,000,000 in February, an increase of 7 per cent. over January, and of 90 per cent. over February, 1945 Publicly financed construction, in contrast to privately financed, declined 10 per cent. from January to $85,000,000 in February.

Mexican Lime Concern Imports Plant from U. S.

Industrial Calera de Huescalapa, S. de R.L.C.V., of Guadalajara, Jalisco, Mexico, recently purchased a new plant from the Lime & Hydrate Plants Co. of York, Pa. The Kuntz Gravity System of Lime Hydration will be installed, along with several other improvements. It is estimated that the new plant, now in process of construction at York, will produce 85 tons of lime per day, representing all types and grades.

New Plant to Be Built by Consolidated Chemical

An announcement by the Consolidated Chemical Industries, Inc., of Houston, Tex., revealed that a new plant for concentration of low-grade bauxite ore will be erected at Little Rock, Ark.

The plant, which is to cost more than $60,000, will utilize a new process developed by the company and will have a capacity of approximately 60 tons daily. Among the products will be aluminum salts, aluminum sulphate, potassium phosphate, ammonium sulphate and other items from a bauxite deposit near Little Rock.

Heavy Damage Caused by Fire at Consumers Plant

A fire which broke out in the Consumers Co. quarry at Ives, Wis., on February 25 caused damage estimated at a sum between $150,000 and $200,000. Consumers Co. offices are located in Chicago.

Surplus Army equipment is beginning to find its way into the pit and quarry industries, as evidenced by these trucks, photographed at the Schield Soft Lime Quarry, Waverly, Ia. Some of the units pictured were used for mounting Schield Bantam draglines, also produced on the Schield quarry property at Waverly.

Six States Provide for Progressive Post-War Road-Building Programs

Creation of a Kansas state highway research department to work for the construction of more enduring roads was proposed by Governor Andrew F. Schoeppel in a recent address before a Kansas highway engineering conference. Nearly $70,000,000 is expected to be available for expenditure on Federal-aid secondary and urban roads in Kansas in the next three years, according to Governor Schoeppel.

It was noted during the conference that a vastly expanded program of rural road construction will be possible in Kansas as a result of a 1-cent increase in the state gasoline tax which went into effect March 1.

As approved by Utah's State Road Commission, the first Utah post-war road budget calls for the expenditure of $5,193,079, exclusive of Federal matching funds. Predicated on an estimated revenue of $4,500,000 during 1946 from gas and motor vehicle taxes and a war-built reserve, the budget provides $1,973,308 to match approximately $5,500,000 in Federal funds.

Chief Engineer Roy W. McLeese said the 1946 budget represents an increase of $2,196,500 over that of 1945, but pointed out that the 1945 budget provided no matching funds for Federal aid, which was discontinued during the war.

Mississippi's Governor Thomas L. Bailey recently signed a bill appropriating $5,000,000 of general revenue to the state highway fund, to be expended for construction and improvement of farm-to-market roads. The appropriation is in addition to Mississippi's contemplated $60,000,000-to-$70,000,000 post-war highway construction program.

A budget for the coming fiscal year calling for expenditures of $39,714,000 for highway construction and maintenance was formally adopted by the Florida State Board. As given final approval, the budget provides for $31,456,276 in new construction, an increase of $2,416,272 over the tentative budget.

The Arizona state highway commission received a report from a state-wide highway planning committee containing recommendations for the expenditure of $10,000,000 on primary road construction in the next two fiscal years, and $4,070,000 on secondary roads.

A bill authorizing issuance of $500,000 in tax anticipation notes to add revenue to the Idaho Highway Department was enacted on March 7 by a special session of the Idaho legislature.

The additional highway department funds had been asked by Governor Arnold Williams to meet "an urgent need for the repair of portions of the present highway system which have during the war years been given little if any maintenance and repair due to the labor shortage." Besides maintenance and repair, he said money was needed to purchase new highway equipment.

Contractors' Group Backs Government Housing Plan By Action at Convention

At the 27th annual convention of the Associated General Contractors of America, held February 18-21 in Chicago, full co-operation and support of the government's housing program was pledged by the members. Practical recommendations to help effectuate this program were brought out by speakers, staff and committee reports and floor discussions.

Included in the suggestions for carrying out the housing program is a plan for channeling the bulk of building materials, for a brief period, from manufacturing plants to locations where housing needs are greatest. All proposed housing projects are to be reviewed and given a priority rating based on the necessity of the project. Complete reliance on private enterprise through a return to the priorities control of L41 was also suggested.

On the labor front, immediate action by labor, management, and government, in developing satisfactory wage rates and agreements which would promote full production was recommended. Recruiting of labor was suggested through an apprentice training program which has proved successful in many localities and received the approval of owners as well as the O.P.A.

Show Window of Building To Be Opened in Boston

New England manufacturers of building materials and equipment for the home will participate in a project described as "The Show Window of the Building Industry," officially known as the Building Center of New England, which is to be opened in June in Boston.

The six-story building, located at 367-377 Boylston Street, will be a permanent exhibit and an information center for all types of building, established as a public service for home owners, builders and architects. It is sponsored by business

Building center to open in June.

men and organizations interested in better housing and improved construction techniques.

Because home building is one of the most urgent needs of the nation, the Center will render public service to individuals and communities by stimulating and facilitating action for better housing. G.I. Information Headquarters will be maintained to aid war veterans who wish to build under the provisions of the G.I. Bill of Rights. Information will be given on building materials and products, and technical assistance will be available for prospective home builders.

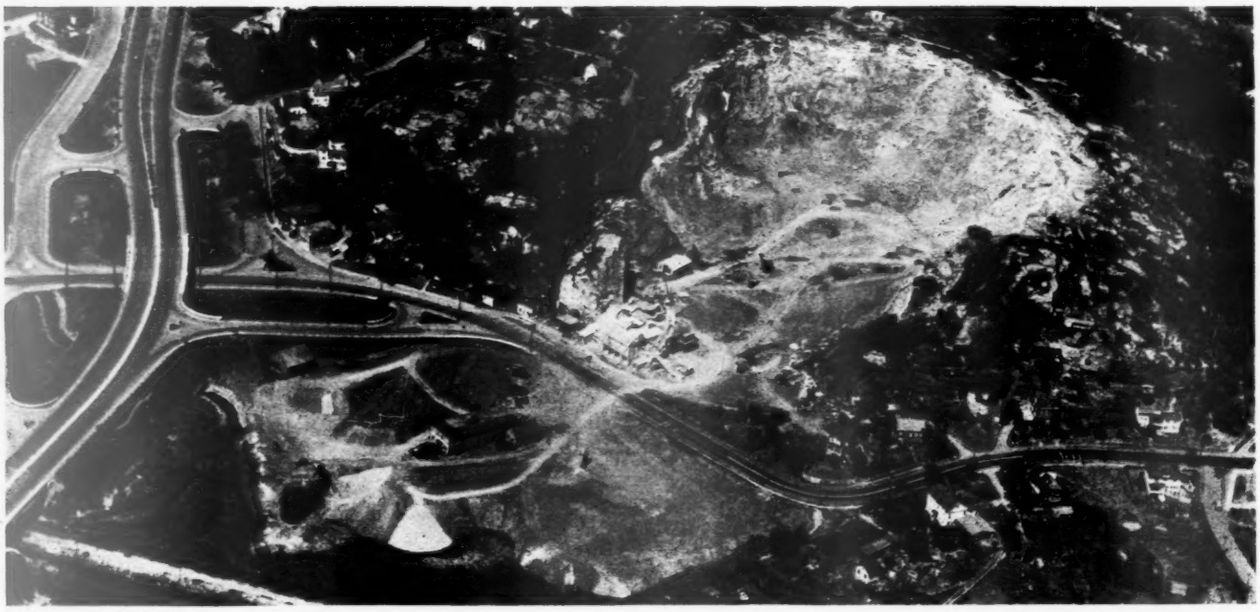
Building Material Costs Parallel Movements of General Prices—Kellogg

Conclusions presented in a study and report of building material price movements by Lester S. Kellogg, Acting Chief, Prices and Cost of Living Branch, Bureau of Labor Statistics, U. S. Department of Labor, are that building material prices today are in general not out of line with the prices of other goods.

As a comparison, Mr. Kellogg points out that price movements during and since World War II have been moderate compared with those of World War I; however, wholesale prices of building materials as a group have increased about 32 per cent. since August 1939. A major part of this increase is in the price of lumber as other materials show much smaller price increases. Price readjustment presents no serious problem, though the author of the report believes particular materials will face realignment.

The readjustment problem for lumber is reported to be acute as prices have risen 75 per cent. since 1939. Mr. Kellogg asserts that such price discrepancies, if continued, may have important effects on the construction industry in that the tendency will be to use masonry products for exterior walls and insulation board for interior walls. Immediate readjustment is not anticipated by him.

Brick and tile prices are reported to be 24 per cent. above pre-war levels, cement is up less than 10 per cent., prepared paints are up 7 per cent., and heating and plumbing fixtures are up 15 per cent. from pre-war prices. Insulation board, roofing, lime and plaster prices have increased less than 10 per cent. in this same period. Assuming continued price controls with no substantial rise in the general level of prices, Mr. Kellogg anticipates only a slight further increase in prices of building materials as a group.



Aerial view of the quarry and plant of the Rowe Contracting Company of Revere, Mass., producer of crushed stone and trap rock.

Allen, Sharpe Appointed To Direct Iowa Agstone Group for 1946 Term

At the annual meeting of the Iowa Agricultural Limestone Association in Des Moines on February 22, Clint A. Allen formerly associated with Sargent

Clint A. Allen

W. F. Sharpe

Brothers of Des Moines, was appointed full-time executive secretary of the association, effective April 1. Mr. Allen will maintain headquarters in the Teachout Building, East Fifth and Locusts Streets in Des Moines.

The new president of the association is W. F. Sharpe of Dillon, Sharpe & Co., Centerville. Mr. Sharpe succeeds Paul M. Nauman of Dubuque.

P.C.A. Presents Plan for Low-Cost Concrete Homes

Mass production of an improved type of concrete house has been suggested by the Portland Cement Association as a means of solving the present critical housing problem. The method, developed after 15 years of research at the association's field laboratory in Elmhurst, Ill., calls for the following procedure: the basement or footing is laid, and then the floor; forms for the walls, with openings for windows and doors, are outlined; heating ducts, electric conduits and other concealed fixtures are installed; concrete is poured into the wall forms and allowed to set for five days; walls are pulled up into place by a tractor and joined by corner columns which are poured last.

P.C.A. specialists say that a five-room house can be sold for about $5,000; and the objective of the experiments is to keep the price, including a building site, within $10,000. However, they point out that no economy can be expected in building only one or two such houses in a community; it must be a mass project. The economy is effected by mass excavation, pouring of floors and walls and lifting of walls. Individuality may be achieved by various types of wall or roof treatment, placing of doors and windows, variety in texture and color of exterior, and so on.

Rock Wool Firm Named Weathermaster Mfg. Co.

The rock wool plant at Tonganoxie, Kan., announced in the February issue of PIT AND QUARRY, has been formally incorporated under the name of the Weathermaster Manufacturing Co. Operations were slated to begin by the middle of February on a three-shift basis. Several types of rock wool will be made, as well as roofing materials.

Canadian Lime Production Nearly 900,000 Tons in 1944

Production of quick and hydrated lime in Canada during 1944 totalled 885,142 short tons valued at $6,926,844, according to a report prepared by the Dominion Bureau of Statistics. Comprising the 1944 production were 738,202 tons of quicklime valued at $5,948,079 and 146,940 tons of hydrated lime valued at $978,765. During the year, 700,708 tons of quicklime and 89,576 tons of hydrated lime were sold or used by producers for chemical manufacture; the remainder of Canadian lime output was sold or used for building, agricultural and other purposes.

Permanente Cement Co. To Ship Cement by Water

As a result of action taken by the Seattle council's public safety committee, the Permanente Cement Co. will be permitted to ship bulk cement to Seattle by water from California. At Permanente's request the council amended a city ordinance regulating cement imports to allow shipments from points up to 1,000 miles away by water.

Sheridan Stone Co. Owners Now Operating Two Plants

The Sheridan Stone Co., Sheridan, Ill., owned and operated by E. J. Seitz and B. M. Seitz, now has a daily output of about 1,100 tons of agricultural limestone and road rock. With the opening of a second quarry near Plano, Ill., known as the Plano Stone Co., the original production was stepped up by 400 to 600 tons daily.

"J. B.", Built in 1909, Hauls 61 Cement Cargoes On Great Lakes in 1945

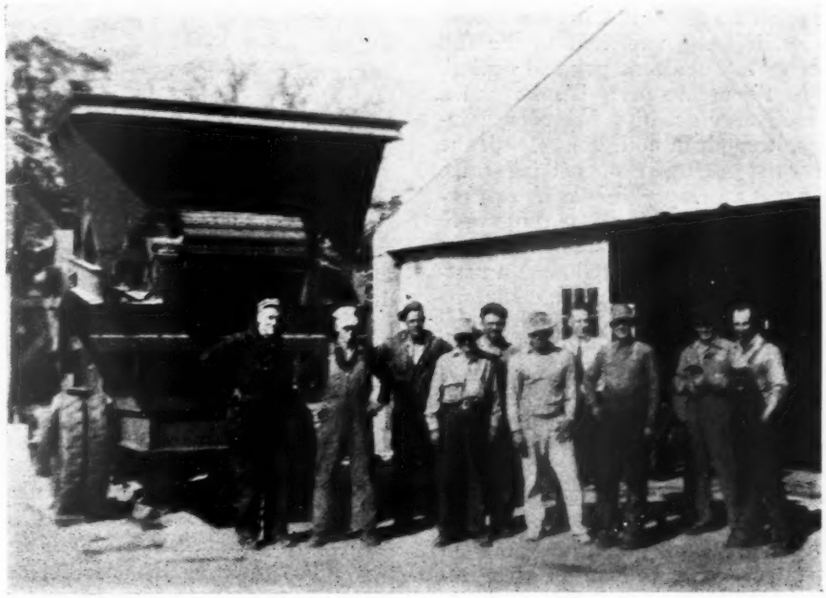
An unusual record has been made by the Petoskey Transportation Company's 37-year-old steamer, the *J. B. John*, which last season carried 61 cargoes of cement through the Great Lakes from Petoskey, Mich. Built in 1909 in New Castle, England, the ship served in both World War I and II. Torpedoed off Gibraltar, the craft limped into port, was repaired and sent back into service. In 1918 she was sent to the bottom off Italy; but the following year she was raised, reconditioned and sent to Canada.

In 1922 the "J. B." began hauling cement, at first in bags, later in bulk. It has been estimated that the ship carried approximately 2,500,000 barrels of cement from the spring of 1942 until the guarded by government order during the end of 1945, figures which were closely war.

Lone Star Cement Corp. To Open Limedale Annex

At the Limedale plant of the Lone Star Cement Corp. of Greencastle, Ind., ground was broken on December 3 for an addition to the packing house. The building, representing the first step in the company's post-war modernization and expansion program, will house three modern packing machines. Carl Erdman, plant superintendent, stated that the annex would be completed about May 1.

Complete but condensed information on nonmetallic minerals production is contained in the statistics chapter of the Pit and Quarry Handbook.



Crew and new portable jaw crusher at Plano Stone Co. quarry, owned and operated by the Sheridan Stone Co.

WASHINGTON NEWS LETTER

THIS month President Truman rounds out his first year of tenure in the chief executive office. The year has not been a notable success either for him, or for the country, or for the world at large. Twelve months ago we were at the brink of overwhelming victory over the "invincible" German armies, and the stage was already set for blasting Japan into equally abject submission. In anticipation of early peace, the San Francisco Conference was about to be held and hopes ran high that a strong foundation was being laid for lasting world unity. And political leaders of both parties were free with pious expressions of appreciation for the new president's difficult task and with easy promises of support for his policies both at home and abroad.

Today the outlook is considerably dimmed and the atmosphere, domestically as well as internationally, is full of dangerous potentialities. The anti-inflation program is under severe, unceasing attack. Major legislative proposals have been sidetracked or watered down. In the case of the Full Employment Bill, even the words "full employment" were absent from the diluted version which was finally passed. Lobby interests, especially in the emergency housing program, have taken precedence over the needs of veterans and the rest of the community. Every issue before Congress, from the extension of the O.P.A. to the British loan, is being exploited to the full for its usefulness as political capital. The President's party is split, and a reactionary coalition has been gaining strength in both houses with the avowed intention of making price control an empty shell as its first order of business. If this purpose were achieved, similar statesmanship in other spheres would follow as a matter of course. When so little concern or understanding is displayed by Congress in dealing with the economic well-being of the country, it is no wonder that there is little appreciation of the true significance of the atomic discoveries. Thus, after weeks of deliberation, the Senate Atomic Energy Committee has come up with a proposal to give to the military authorities an even greater degree of control than requested by the armed services themselves. To round out the unhappy picture, irresponsible war talk is heard everywhere, and is fed constantly by alarmist rumors, "unconfirmed reports," and all kinds of half-truths in the press and over the radio.

The President must take his share of the blame for the current state of affairs. He seems to have a distressing knack for making serious *faux pas*. His off-hand statements on atomic power a few months back set the pace for much that has followed. He has made a number of undesirable and unworthy nominations to important official posts. He has lent the dignity of his office to the fulminations of a defeated political leader of another country. He has surrounded himself with advisors of narrow vision and limited ability, so that he is often faced with difficult problems long after they could have been prevented, and is forced to make decisions which only lead to further complications. A good example of this is the Administration's belated discovery of a serious food crisis in many parts of the world. That this should have come as a surprise to officials charged with keeping track of such matters is incredible enough, but even more significant is our deserved embarrassment at having stripped away all food controls at a time when literally tens of millions of people were in danger of starvation. This situation closely parallels the home-construction program which, months after the relaxation of building controls, now requires a whole new set of strict measures.

Throughout the year the President has acted as if good intentions could be realized by frequent repetition of high-sounding phrases and by a sturdy faith that everything will be all right in the end. That he has been bedeviled by irreconcilables of both parties in Congress is undeniable and generally appreciated. But the average citizen expects more than platitudes from its chief executive, as evidenced in the noticeable cooling-off of public enthusiasm for Mr. Truman. The next congressional elections are only a few months away. At this stage, it is difficult to predict whether Mr. Truman will receive a vote of confidence by the election of more liberal candidates, or whether his hands will be tied still tighter by the election of legislators opposed to his mildly progressive philosophy.

One factor looms large in Mr. Truman's favor—the current and prospective level of economic activity. Reconversion has proceeded much faster than expected. The Federal budget has been balanced. The first wave of strikes is over. Unemployment has been held within bounds and, on the whole, job opportunities for veterans are not lacking. Industrial activity as measured by the Federal Reserve Board Index is already more than 40 per cent. higher than the pre-war high points of 1929 and 1937. The chief obstacles to the rapid growth of industrial output between now and the end of the year lie in the threatened tie-ups in coal and on the railroads.

Barring prolonged stoppages in these basic industries, with their consequent paralyzing effect on the rest of the economy, the present feeling among government economists is that total employment during 1946 will probably increase by fully 5,000,000, and that by the end of the year we will once again be experiencing a very tight labor market. This estimate is based upon the enormous demand evident in all sectors of the economy, for housing, for durable equipment, and for consumer goods. This demand is still being supported by the large volume of accumulated savings. Recent studies show that liquid assets—cash, bank deposits, and government bonds—in the hands of individuals and businesses now exceed $225,000,000,000. Consumer spending has already increased by 10 per cent. since the last quarter of 1945. It is now figured that such expenditures will probably go up another 10 per cent.—to an annual rate of close to $130,000,000,000—by the year-end. This forecast of prosperity spending levels is predicated upon the continuation of price control. If the coalition referred to above should succeed in eliminating the chief bulwark against inflation, there is no telling what heights the resultant boom could reach, or to what depths the inevitable bust would fall.

According to *Engineering News Record,* the total construction backlog, measured from January, 1943, through December, 1945, is slightly over $28,000,000,000. Of this amount, 2 per cent. was advanced to contract-awarded status during 1945. About 35 per cent. of the total backlog can be allocated to buildings, and of this segment approximately 64 per cent. is classified as public buildings.

MEN OF THE INDUSTRY

Spokane's Eric Johnston Enthusiastic Proponent Of People's Capitalism

"AN accident made Eric A. Johnston a business man." It is not proposed to dispute this statement, but it is evident that the incident marks the beginning of Mr. Johnston's business career which was followed by outstanding success in industry, commerce, and finance, and in government whether national or international. The most recent acknowledgement of his capacity and ability was his election as president of the Motion Picture Association of America last September.

His success in the nonmetallic mineral industry may be gleaned from the following quotation extracted from his book *America Unlimited*, published in 1944.

"In behalf of a bank I undertook to salvage the Washington Brick, Lime and Sewer Pipe Company, which was in deep red to the tune of $260,000. This was in 1933 — a year of gloomiest depression—and temptation was strong to liquidate the meager assets of the organization. Instead, I put it back to work, and recently, just 10 years later, I turned the company back to its owners without a trace of red on the balance sheet, sizable capital in the bank, and profitable operation in full blast. As head of the company I take keenest pride not only in its survival and prosperity, but in the circumstances that its minimum wage, for common labor, has risen in the decade from thirty-seven and one-half to eighty-six cents an hour."

Born in Washington, D.C., in 1895, Mr. Johnston found it necessary to begin his business career at an early age. While living in Spokane, Washington, his father died, whereupon he bent his efforts to selling newspapers and later serving as school correspondent for a local newspaper. Spurred on by the offer of an uncle in Seattle to make a place for him in his law office, Mr. Johnston enrolled in the law course at the University of Washington where as an undergraduate he worked nights as a longshoreman on the docks of Seattle. When World War I came in his senior year, he was one of six recommended by the president of the university as officer material for the Marine Corps. Commissioned a second lieutenant, he served as bayonet instructor at Quantico, Virginia, and Mare Island, California; in 1918 he became a captain and was detailed to the legation guard at Peking, China. Later, as an assistant naval attache, he traveled into interior China, Siberia, and Japan.

Mr. Johnston's intention of making a career of the Marine Corps was somewhat changed by the aforementioned accident. While carrying out official business in a hostile area

Eric A. Johnston

of the Chinese capital in 1921, he was "clubbed" over the head during a "row" with the natives. His injuries and the ensuing illness hospitalized him for a year, after which he had to abandon his ambition to remain in the Corps. Back home in Seattle, physicians advised him to engage in outdoor work.

He made an inauspicious start as a salesman of vacuum cleaners, ringing doorbells for two weeks before making a sale. Soon the number of sales increased as did his interest in vacuum cleaners and electrical appliances. His enthusiasm led him to buy a partnership in the company for which he was working. A year and a half later he learned that a large electrical concern in Spokane, which engaged in both selling and manufacturing, was for sale. With his partner he borrowed $75,000 and bought the Spokane company, paying off his loan in six years.

Fellow business men in the Pacific Northwest were quick to recognize Mr. Johnston's talents, and in 1929 he was elected president of the Inland Empire Manufacturer's Association, and in 1931 he became president of the Spokane Chamber of Commerce. Two banks and an insurance company made him a member of their boards of directors.

One of these banks had a customer, the Washington Brick, Lime and Sewer Pipe Company, who owed a total of $260,000 and had virtually ceased operations. In 1933, in the depths of the depression, Mr. Johnston was put in charge of the company as trustee for the creditors. Ten years later he turned it back to the owner debt free, with $150,000 in the bank, and with property improvements costing $170,000. He subsequently bought into the enterprise and is the present chairman of the board of directors. This plant is now the Washington Brick & Lime Company of Spokane with 6 plants in Idaho, Oregon, and Washington producing agricultural limestone, clay, concrete products, dolomite, fluxing stone, lime, lime putty, marble, refractory brick, and whiting. A profit-sharing plan for employees has been introduced by Mr. Johnston which is based on points for annual earnings, years of service, membership on the junior board, and many other considerations. The cash value of these points is determined by dividing the sum to be shared by the total number of points due all employees for the year. The amount to be shared will be reckoned on 25 per cent. of the net trading profits before taxes and dividends are paid.

Mr. Johnston's leadership and influence was and is recognized in other spheres of business. In 1933 he was elected a director of the U. S. Chamber of Commerce and in 1941 was elected to one of the vice-presidencies. The following year he became president and has continued in that capacity for four terms. He has been guided by a basic philosophy derived from a belief in "a people's capitalism", which he sets off against "the capitalism of the bureaucrats" and "the capitalism of private monopoly and special privilege".

"The people's capitalism", he says, "thrives on its diversity of economic forms and undertakings. It rests, in the ultimate checkup, not on the prosperity of the state or the prosperity of a few business units, but on a prosperous people. Only an increasingly prosperous people can offer an increasing market for the products of labor and business. Only a prosperous people will create new capital for new enterprises."

This philosophy and his willing-

(*Continued on page* 68)

BARNSDALL'S MODERN PLANT PROCESSES TRIPOLI, ONE OF OLDEST NON-METALS

Power shovel loading Tripoli into truck at one of deposits.

By WALTER E. TRAUFFER

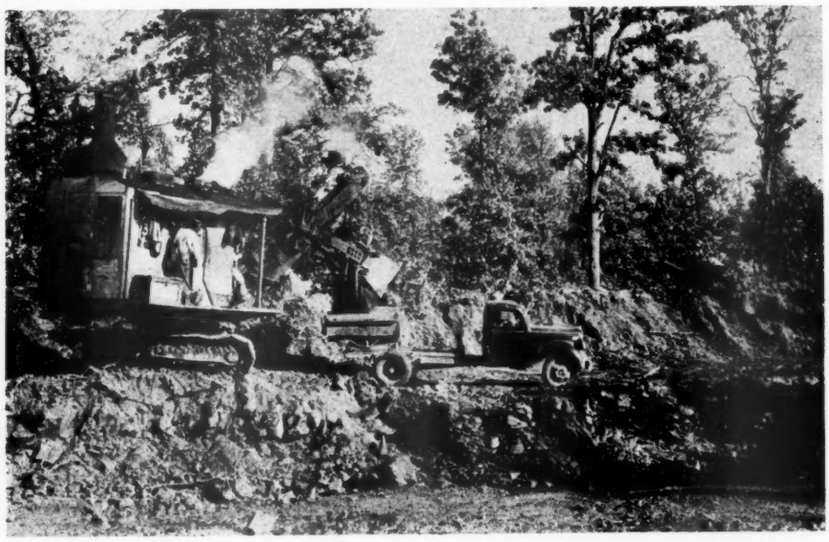
another ON THE SPOT report

ONE of the least known but oldest of the nonmetallic-minerals produced in this country is Tripoli, an unusual form of silica, with a peculiar particle structure, which is now being produced in only a few locations in this country. The Barnsdall Tripoli Corporation's new plant at Seneca, Missouri, is supplied by deposits which were discovered in 1869, two years before the arrival of the "Frisco" railroad. The deposits were first worked in 1871 when a small mill was built by the Monarch Tripoli Company for sawing the stone into small bricks, which were called "American Bath Brick" and were used for scouring and polishing purposes.

The first grinding mill was built in 1885, using the old-style horizontal flour mill grinding stones. When the American Tripoli Company was organized in 1888, another and better mill was built. In 1919-1920 the Barnsdall Corporation bought this company and the Seneca Tripoli Company and combined their operations, building a new mill which operated until December, 1938, when it was completely destroyed by fire. In 1931 the name was changed to Barnsdall Tripoli Company and in 1935 to Barnsdall Tripoli Corporation. A new all-steel mill was built at once and this was put in operation in April, 1939. E. H. Dobbs, Vice President and General Manager, designed the new plant and supervised its construction. Since then a number of minor improvements have been made. The capacity of the new mill is 10 tons per hour of finished material with only one-half of the power consumption of the old 6-t.p.h. mill it replaced.

The most important use of Tripoli until about 1915 was in the manufacture of filter stones. Their manufacture was discontinued entirely in 1924. Powdered Tripoli had been sold since 1885 as a mild abrasive for use in scouring and polishing powders and in buffing compositions and this has become one of the major outlets. Another major outlet is for use as a rubbing compound on "Duco" and lacquer surfaces. In 1915 it was found that Tripoli could be suitably waterproofed and used as a foundry parting and this is now a major outlet. The electronics field promises to be a large future outlet.

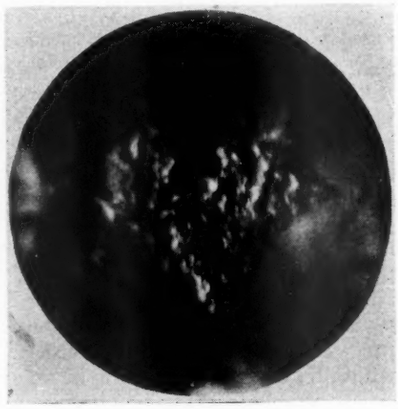
Power shovel loading Tripoli into truck at one of deposits.



Before the war, about 30 per cent. of the output was exported.

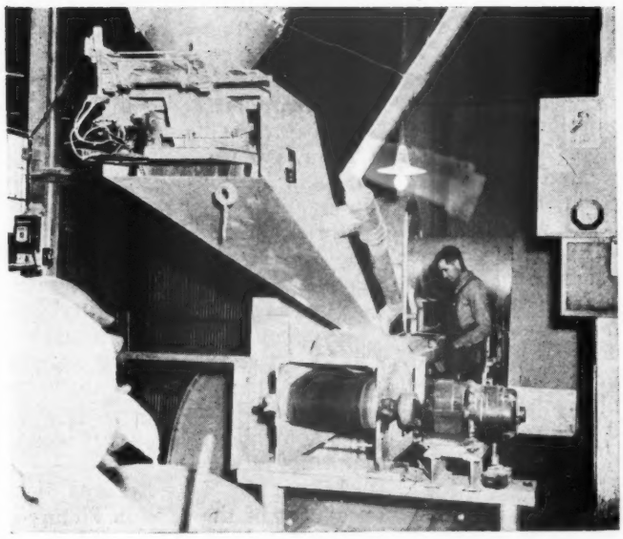
The Seneca Tripoli is an unusual form of silica which is found in commercially valuable deposits only in this area. It is a soft, friable, porous silica of the Chalcedony variety and varies from 90 to 98 per cent. SiO_2 with less than ½ of 1 per cent. free silica in the form of quartz, ignition loss of 1 per cent., and fractional percentages of iron, alumina, lime, etc.

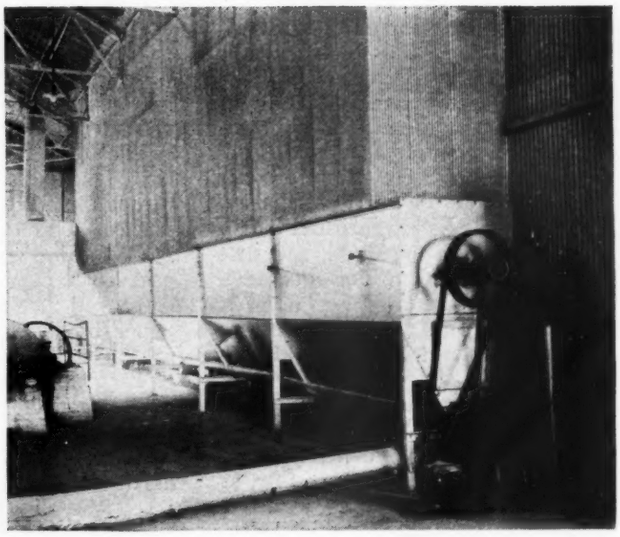
The deposits are of sedimentary origin and are found in the Boone formation of the Lower Mississippian. They occur as horizontal beds in thicknesses up to about twelve feet.



Photomicrograph (600 X) of a particle of tripoli showing its porous structure.

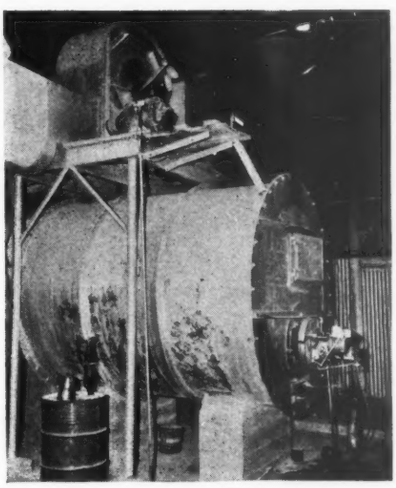
The first step in opening up a

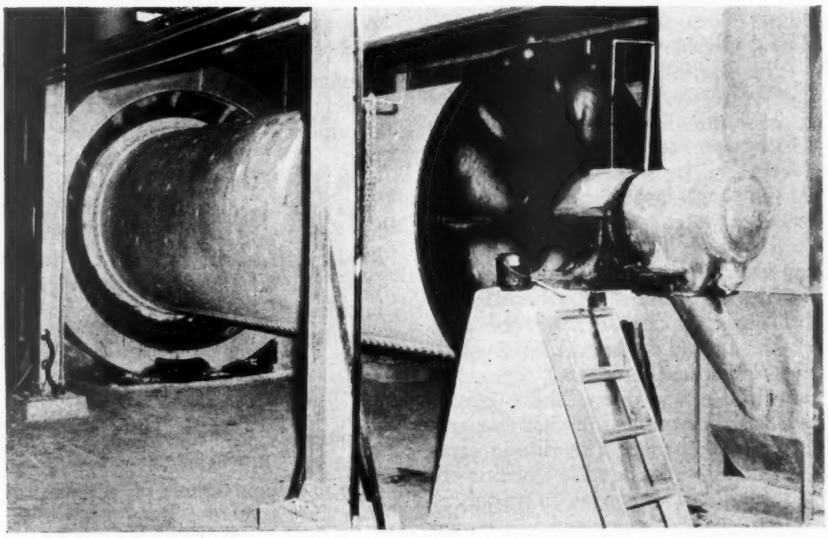


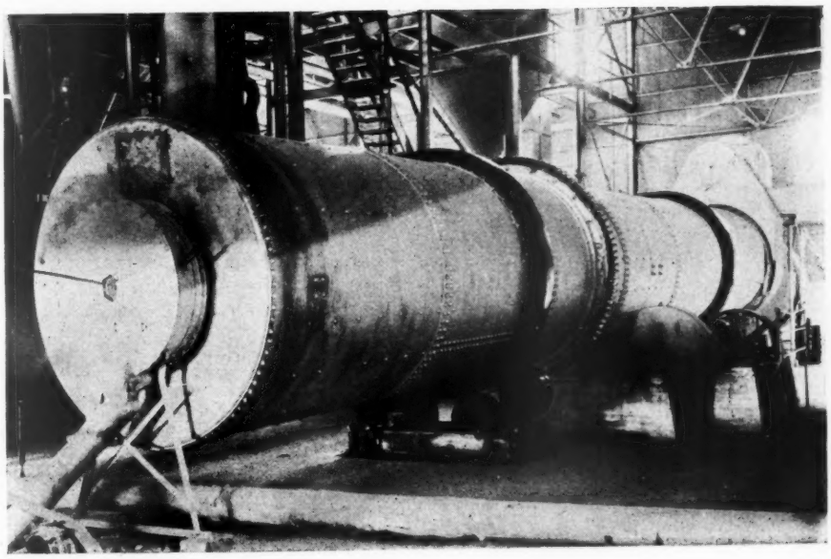


Above, left: Constant-weight feeder discharging partially dried crushed material on picking conveyor ahead of drier. Right: Cloth bag dust collector from which dust is returned to circuit by screw conveyor in foreground.

Below, left: Combustion chamber, oil burner and draft fan of the 6- by 55-foot rotary drier. Right: The 6- by 18-foot tube mill in the Barnsdall plant which uses flint pebbles and liners.







Above: The 6-foot triple-whizzer separator used for fine sizing, with electric vibrating screen in background. Right: The 6- by 55-foot indirect-fired rotary drier viewed from discharge end.

deposit is to clear away the timber, as most of the land is not suitable for agriculture and is heavily wooded. The overburden, which averages about the same thickness as the deposit, is then removed by a shovel and the surface of the deposit is then hand cleaned to prevent contamination by earth or clay. Churn drill holes are then put down, chambered with dynamite, and shot with black powder to prevent undue production of fines. The Tripoli is then loaded into trucks by a power shovel and hauled to the drying sheds.

The crude stone, being very absorbent, contains from 20 to 35 per cent. moisture, depending on weather conditions. Consequently, as weather drying produces a better grade than immediate artificial drying, the crude stone is ricked in double-decked drying sheds holding about 350 tons each. There are thirty-seven such sheds each 100 by 20 feet. Some three to six months are required for shed drying to a point of moisture equilibrium with the atmosphere.

The partially-dried crude rock is hauled to the mill by trucks where it is dumped into a hopper from which a pan feeder discharges it into a crusher. It is then elevated to a 50-ton steel hopper from which a constant-weight feeder discharges it on a 20-inch by 20-foot picking belt-conveyor. Flint, clay, and other impurities are removed by hand.

From this conveyor the rock is discharged into a 6- by 55-foot Hardinge Ruggles-Coles indirect-fired rotary drier. This is equipped with a combustion chamber and a Ray oil burner. The drying temperature is regulated according to the grade of material in order to insure the best possible product. Dust from the drier is blown by a Buffalo No. 55 draft fan into a series of cloth-bag dust collectors. The collected dust is recovered from a hopper by a series of two screw conveyors. The air released from the bag collectors passes through a spray chamber which removes any remaining dust from the air which then goes to the drier stack.

The dried rock is discharged from the drier to a bucket elevator which feeds it to a No. 28 Kennedy-Van Saun hammer-mill with a ½-inch grate. A screw conveyor then feeds the material through the trunnion of a 6- by 18-foot Kennedy-Van Saun tube mill. Jasper flint liners and pebbles are used.

The pulverized Tripoli is then elevated to four 3- by 5-foot Tyler Hum-mer 2-deck screens. By changing the screen cloth, different sizes can be made. When extra-fine sizes are desired, the material is discharged from the elevator into a 6-foot Raymond triple-whizzer separator in order to make two sizes of material simultaneously.

The finished Tripoli is discharged from the screens and separators through pipes to a St. Regis Valve packer. This machine was installed in 1944 and replaced two double packers of own design. The Tripoli is packed in 100-pound multi-wall paper bags. There is storage space in the mill building for 500 tons of bagged Tripoli.

Dust collector pipe intakes at the crusher, the feeders, the packers and other points keep the plant nearly dustless.

Men of the Industry

(*from p.* 65)

ness to accept responsibilities have successfully carried Mr. Johnston through many trying diplomatic situations. As president of the National Chamber in 1942, he exercised his talents in bridging the existing gap which had existed between the late President Roosevelt and the Chamber. A five-minute appointment with Mr. Roosevelt lasted ½ hour with Mr. Johnston being invited to luncheon. Cooperative relations were established to the extent that he was later chosen to represent American business on innumerable governmental and semi-governmental missions and committees.

Among the organizations in which he has served or is serving are: the Committee for Economic Development, the Business Advisory Council of the Department of Commerce, the Management-Labor Policy Committee of the War Manpower Commission, the Postwar Economic Foreign Policy Committee of the Department of State, the Inter-American Development Commission, the Advisory Committee for Civilian Policy of the War Production Board, the Economic Stabilization Board, and the War Mobilization and Reconversion Committee. He is a director of the United Air Lines, the Bank of America, and National Director of the American Cancer Society.

An extensive traveler within the United States, Mr. Johnston has also had the opportunity of working wiith foreign groups. In 1943, at the request of the State Department and the Coordinator of Inter-American Affairs, he toured South America, conferring with Commissions for Inter-American Development in five major countries in order to lay a foundation for post-war cooperation among business men of the western hemisphere. He also conferred with British leaders to promote a better Anglo-American understanding. At the invitation of the Soviet government in 1944, he spent 8 weeks visiting and studying Soviet industry. A brief interview was arranged by the American Embassy with Premier Stalin at the Kremlin. This turned out to be a two-hour conference in which both exchanged frank views about the relations of the two countries and the world. At the request of former Secretary of State Stettinius, Mr. Johnston has made similar visits to Mexico.

When Mr. Johnston was elected president of the Motion Picture Association of America in September 1945, he made the following statement as his reason for accepting the position: "I have been attracted to the motion picture industry because it offers unlimited opportunities to work for peace and prosperity at home and abroad. These are the two goals for which all mankind yearns today." Upon arriving in Hollywood to assume office he was faced with a labor situation which had rocked the movie colony for months. Mr. Johnston applied the techniques which he had long advocated and practiced: let labor and management sit down together to find areas of agreement between them. He met with labor leaders in Hollywood, and then flew to Cincinnati, Ohio, to appear before the Executive Council of the A.F. of L.; the first time in history that a business man had met with this body. A formula for settlement of the strike was worked out in the house of labor itself.

Mr. Johnston's philosophy of life is clearly expounded in his book, *America Unlimited,* which was published in 1944. In it he points out the potentialities of the "people's capitalism" in which all elements of the population, business, agricultural, labor, and government will jointly work out the problems that retard greater progress toward full realization of the prosperity which is America's birthright.

The Pit and Quarry Directory will show you that a large and steadily-growing percentage of ready-mixed concrete plants are operated by aggregates producers.

A. I. M. E. CONVENTION PUTS EMPHASIS ON MINING METHODS AND EQUIPMENT

Trip Through Laboratory Of Allis-Chalmers Is Special Feature

another ON THE SPOT report

THE annual meeting of the American Institute of Mining and Metallurgical Engineers was held at the Palmer House in Chicago from February 25 to 28, inclusive. One of the highlights of the four-day meeting was a visit to the new Allis-Chalmers basic industries laboratory at Milwaukee, Wisconsin, attended by more than 50 persons identified with the mining section of the institute. By observing actual test operations in special sections of the laboratory designed to handle the specific problems of concentration, recovery and processing of almost every kind of industrial basic raw material, the visitors learned how these new facilities enable Allis-Chalmers' engineers to make recommendations which can be expected to avoid costly errors of process or design in the equipment installations involved.

In a paper entitled *Crushing Tests by Pressure and Impact,* Fred C. Bond, Director, Basic Industries Laboratory, Allis-Chalmers Manufacturing Co., discussed basic procedures in the standard method of determining the crushing resistance of rock. He described three different types of pendulum devices which have been developed in the laboratory to replace the customary drop-weight methods.

The first of these was constructed in 1934; it consisted of a special head attached to an Amsler impact testing machine, arranged so that in breaking a standard test bar the energy of the falling pendulum was divided between that required to break the standard bar and that required to crush a sample of stone placed under a piston in the pendulum. This apparatus was replaced in 1938 by the first twin-ball pendulum impact device, in which 10 grams of screen-sized sample were crushed between two hardened steel pistons struck simultaneously by two 3-inch steel balls released by cutting a cord.

The impact device used at present consists of two standard 22-inch front bicycle wheels, each reinforced with a steel band encircling the wheel and carrying identical steel hammer bars 2 inches square and 28 inches long. The center of each bar is 16 inches below the axles of the wheels, which are mounted in line in a frame, so that when they are at rest the ends of the suspended horizontal hammer bars are separated by the thickness of the specimen to be crushed between them.

The ends of the hammers opposite the striking ends carry hooks. In operation the two hooks are connected by a cord which passes up over both wheels and over an adjustable block of wood separating the wheels. When the hammers have been adjusted to the desired setting, the cord is cut and they fall freely to strike simultaneous blows on opposite ends of the specimen. There is seldom much rebound when the stone is broken, and the vertical component is negligible.

Ball Wear and Functioning of the Ball Load in a Fine-Grinding Ball Mill, by W. I. Garms and J. L. Stevens, presented a resume of reports covering recent tests conducted at the Hayden plant of the Kennecott Copper Corp. Some of the paper's conclusions: The largest balls function near the periphery of the load and accomplish most of the impact crushing, while the smaller balls concentrate in the interior of the load, where grinding is done chiefly by attrition. During the major portion of ball wear, a film of definite thickness is periodically removed from each ball regardless of its size.

In a paper entitled *Installation and Performance of Sand Pumps,* C. G. Southmayd, hydraulic engineer, discussed some of the variable factors involved in the transportation of solids in solution. He pointed out that there is great need for further experimental work in the determination of critical velocities and friction factors applicable to pulps encountered in mill circuits, and he urged that mill superintendents and operators endeavor to collect such data as can conveniently be determined in their own operations and freely exchange such information.

William B. Stephenson, manager of pump sales for the Allen-Sherman-Hoff Co., presented a paper on *Practical Aspects of Pumping Sands, Slurries and Slimes.* Some of his conclusions: Velocities of solid-fluid mixtures in pipe lines must be maintained above the critical points in the discharge pipe line; total dynamic heads must be figured accurately and sump and pump design must be fitted to the particular problem at hand; operating and mainte-

An interesting stop during a tour through the Allis-Chalmers Mfg. Company's five-story laboratory by visitors from the A.I.M.E. F. C. Bond (extreme left), metallurgist with the Allis-Chalmers Crushing, Cement and Mining Section, Basic Industries Department, points to the ball mill discharge into a bucket elevator. At extreme right are two of Pit and Quarry's editors, William M. Avery and Floyd C. Leverette.

nance procedures must be set up and adhered to.

In the session dealing with concentration of miscellaneous minerals, Dr. I. M. Le Baron, Chief of Ore Dressing, International Minerals & Chemical Corp., discussed the effect of various flow sheets on the efficiency of phosphate recovery at the corporation's Peace Valley Plant. According to Dr. Le Baron the 150-foot hydroseparator recently installed at Peace Valley has performed in a satisfactory manner, although underflow runs about 25 per cent. solids instead of the anticipated 40 per cent.

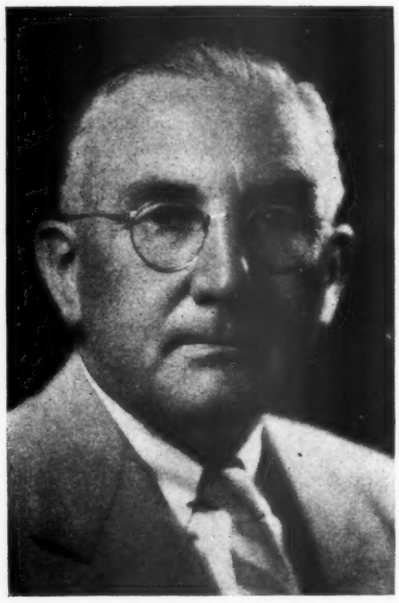
Pinch hitting for H. B. Johnson, vice president of the Ritter Products Corp., Dr. Le Baron also presented the discussion on the electrostatic concentration of phosphate rock. He described briefly the operations of the American Agricultural Corporation's plant at Pierce, Florida, where electrostatic concentration has been employed for the past eight years. The method gives best results on the coarser fractions of phosphate, since fine particles have a tendency to take up the charge too readily.

Dr. Le Baron pointed out that 15 years ago an electrostatic plant with a capacity of 25 tons per hour cost about $75,000 to install. The cost of a comparable plant today is about $45,000, and the floor space required for the equipment has been reduced considerably. Although the development of electrostatic concentration is still in its early stages, Dr. Le Baron thinks it has excellent future possibilities.

At the session on sink-float concentration S. J. Swainson, director of ore dressing for the American Cyanimid Co., discussed progress in heavy media separation during recent years. In 1942, according to Mr. Swainson, only 6 heavy media plants were in operation, but in the following three-year period 11 new installations were made—6 for iron ore, 3 for fluorspar, one for refractories, and one for the treatment of material in dumps at Leadville. These plants have treated 40,000,000 tons of various ores, Mr. Swainson said.

The speaker reported that many important new developments are now in progress in heavy media separation. The processes have been extended, he said, to cover material down to 48-mesh. During the discussion following his presentation Mr. Swainson disclosed that his company has developed a "jeep" plant with a capacity of 10 to 15 tons per hour which will probably cost about $12,000. Fluorspar operators have shown considerable interest in this almost-portable plant and one installation will probably be made this year.

H. L. McNeil, mining engineer for the Stearns Rogers Manufacturing Co., reported to the meeting on his company's development of a selective media concentrator in which the material itself functions as the medium. Although the equipment has so far been adapted only for the treatment of iron ores, it is thought to have excellent possibilities for the concentration of other materials. The principle of its operation involves a variable speed rotating cone inside a fixed cone, with a counterflow of water coming up from the bottom. Ore is fed to the top and recovered from the base in a chain drag boot.



James A. Barr
Chief engineer, International Minerals & Chemical Corp.

Continuous Centrifuges in the Mineral Industry, a paper prepared by S. C. Lyons and A. T. Johnson, both of the Georgia Kaolin Co., described some of the principal uses now being made of continuous centrifuges and the basic theory of their operation. According to the authors, capacities now vary between 50 and 60 tons per hour, with power requirements in the range of 2 horsepower per ton. Some machines have been in use for as long as 10 years and have treated as much as 500,000 tons of material.

The session on prospecting for nonmetals was opened with a foreword on the phosphate industry by James A. Barr, chief engineer, International Minerals & Chemical Corp. Mr. Barr described some of the crude prospecting methods used in the early days of the phosphate industry, following the discovery of the material in Tennessee about 1890. Even with cheap labor, he pointed out, open pit prospecting proved prohibitively costly, and the industry soon began experimenting with other methods. The hand augers soon introduced were satisfactory in the Mt. Pleasant area of Tennessee where overburden seldom exceeded 35 feet, but in the Hickman County fields they were far from satisfactory due to overburdens ranging from 85 to 120 feet.

Another speaker presented a brief description of a mechanical prospecting rig, similar in appearance to a wagon drill, which has recently been marketed by the Hoover & Mason Co. Said to work satisfactorily in unconsolidated sands and clays, the machine can drill prospecting holes to a depth of 100 feet, and it is claimed to be capable of sinking an average 35-foot hole in 15 minutes.

Dr. Le Baron described a new type of core barrel which has been developed by International, but admitted somewhat ruefully that so far they have had little success in withdrawing the 9-foot undisturbed core which the device cuts. Pending further development of this method, he said, they are now using a power-driven auger which they withdraw frequently in order to obtain cores, but he pointed out that this procedure was costly and not too satisfactory from the standpoint of accuracy.

Human Body a Potential Sparkplug for Explosions

Enough static electricity can be generated in the human body or in ungrounded equipment and structures to detonate half a dozen different kinds of explosives such as those used in coal and other mines, according to a U. S. Bureau of Mines investigation reported to the public by Dr. R. R. Sayers, director.

Described as probably the least understood hazard associated with explosives, the sensitivity of explosives to static electricity has been studied by the Bureau for several years.

In addition to determining the electrostatic currents required to set off various types of explosives, the Bureau investigators measured the static electricity capacity of several human beings under varying conditions. The results of the experiments, together with some detailed descriptions of testing equipment, are given in the report.

A copy of the Report of Investigations 3852, "Sensitivity of Explosives to Initiation by Electrostatic Discharges," may be obtained free from the Bureau of Mines, Department of the Interior, Washington 25, D. C.

Method Is Developed for Determining Magnitude of Damaging Shaft Current

By D. B. HOOVER
Electrical Design Engineer,
Westinghouse Electric Corp.

SHAFT currents in industrial motors and generators may cause excessive bearing wear and resultant bearing failure. In most cases current that is present in the shaft must cross the bearing oil film and flow into the bearing shell. This action pits the bearing surface, and often the shaft, causing bearing wear and frequent bearing wiping. The rate of bearing wear may be rapid, causing bearing failure in a matter of days, or it may be of a slower nature, causing bearing failure after a long period of operation. Bearing wear is accelerated if the current is large and the loading high. Shaft currents are usually not present in sufficient magnitude to cause bearing damage in motors and generators that have rotors of less than 20

Fig. 1. Bearing surface which has been pitted by shaft currents. Magnified 54 times.

inches in diameter. Machines of this size have a record of practically no trouble in this respect.

The surface of a bearing which has had bearing currents is covered with fine pit marks (Fig. 1). These pits are often found in bands around the bearing surface, and if the current is very severe the shaft itself will have pit marks.

A simple method of determining the presence of possible bearing currents is to attach a short heavy cable to the bearing bracket or bearing pedestal of the machine, and then touch the other end of the cable to the rotating shaft as illustrated in Fig. 2. Persistent electrical sparks between the shaft and the cable end indicate that bearing currents are possible. However, this test in itself will not show if there are bearing currents of sufficient magnitude to damage the bearing. Nevertheless, if the bearing surface has a pitted appearance and if sparks are present between the shaft and cable, it is nearly certain that damaging bearing currents exist.

Bearing currents may be either direct or alternating, depending on their cause. Magnetic dissymetry of a machine will cause an a-c voltage to be generated in the shaft. This voltage will tend to circulate current through the shaft, across the bearing oil film, through the base and thence back through the other bearing as shown in Figure 3. Bearing currents of this type may be present even in a perfectly designed machine, since manufacturing variations may introduce slight magnetic dissymetry in a machine.

Magnetization of the shaft may produce d.-c. bearing currents. The method of connecting the series and commutating fields of a d.-c. machine may produce a magnetizing effect on the shaft of the machine if the load current is allowed to make an uncompensated turn around the shaft. This action is exactly the same as an elementary iron core electromagnet which has turns of wire about its core. It is possible by proper connection to reduce the shaft magnetization to a small value. This mag-

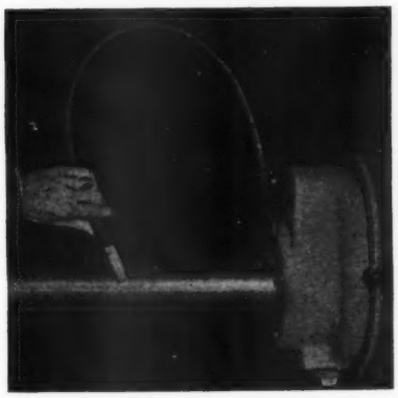
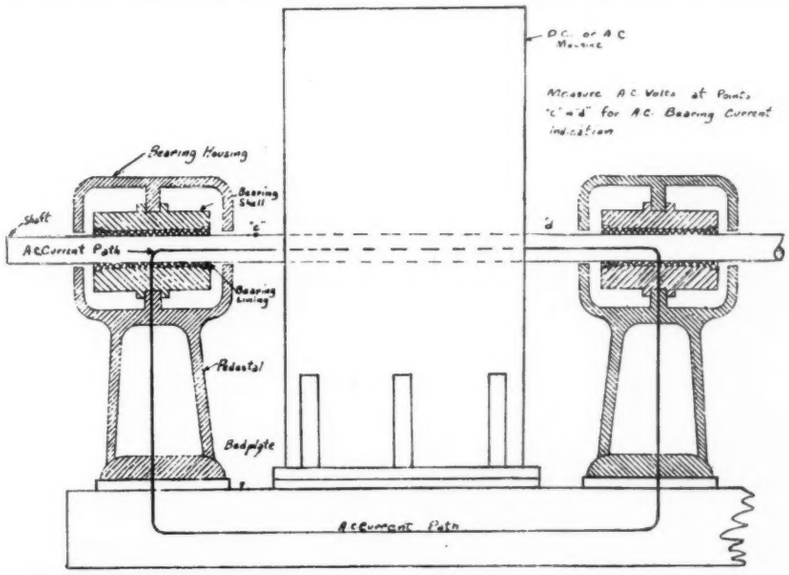


Fig. 2. Bearing currents can be detected by holding a cable with one end fastened to the bearing housing against the shaft of a rotating machine. Sparks at point of contact between cable and shaft indicate possibility of bearing currents.

netizing effect will cause magnetic flux to pass along the shaft, across the bearing oil film, through the base and thence back through the other bearing. The flux set up by the magnetizing force generates a homopolar d.-c. voltage in the shaft along the bearing. This voltage, if sufficiently large, causes direct currents to circulate from the shaft through the bearing and back to the shaft. In other words this bearing current circulates

Fig. 3. Path of a.-c. shaft currents produced by magnetic dissymmetry in a machine.



locally within the bearing, as shown in Fig. 4, and does not flow through the entire length of the shaft.

A.-c. bearing currents may be best eliminated by insulating one bearing, including holding down bolts, dowels, oil piping and grounded connections. This insulation will break the path of the current and no further bearing current is possible if the insulation is kept clean and in good condition.

D.-c. bearing currents may be best eliminated by reducing the magnetizing force around the shaft. It is recommended that the manufacturer of the machine be contacted in this case. Bearing insulation will reduce the flux and thereby reduce the internal circulating bearing currents. The reduction gained by this method is often enough to eliminate bearing damage.

Both a.-c. and d.-c. bearing currents may be reduced by shunting most of the bearing current out of the bearing. This may be accomplished by adding brushholders (with brushes that ride on the shaft) to the bearing pedestal or bracket in a manner similar to that indicated in Fig. 5. Brushes for this application must have very low resistance since the resistance of the brushes must be much less than the resistance of the bearing oil film. Metal graphite brushes with high copper content are suitable for this use. This method will usually reduce bearing currents to a safe value on all types of bearing currents. However, the brushes require a certain amount of maintenance and may be objectionable from this point of view.

The presence of some bearing current may not damage the bearings of a machine. The magnitude of the damage is dependent on bearing current, bearing loading, condition of the oil, and condition of the bearing and journal surfaces.

The voltage measured across the shaft on each side of a bearing is an indication of possible d.-c. bearing currents. Usually a voltage of 150 millivolts (measured with a d.-c. millivolt meter) will not circulate currents of sufficient magnitude to cause damage in a sleeve bearing. If an a.-c. voltage is present across the shaft of a machine (from a point on each side of the rotor on the shaft inside of each bearing pedestal or bracket) it is evidence that some a.-c. shaft current may be present. However, it is not possible to take reliable electrical readings of the magnitudes of bearing currents and voltages with ordinary instruments. An oscillograph will give much better results when used with the proper shunts and elements. Even if reliable readings are taken they are difficult to interpret in terms of possible damage because of the variable factors entering into bearing damage.

Proper maintenance of oil and bearing conditions tends to eliminate wear caused by bearing currents, since a good clean oil film increases the resistance to current flow. This oil film acts as an insulator except for very minute projections on the bearing surface which may press through the oil film. Some machines are originally built with bearings that are insulated, depending on the type of bearing, the speed of rotation, the bearing load, and the size and rating of the machine. Any insulated bearings should be checked periodically to make sure that they remain insulated. Often mechanical parts which are close to the bearing will be moved and short across the bearing insulation, causing shaft current to flow. Likewise dirty or poor insulation will cause the same trouble. These points can be readily checked at each inspection.

It is wise to consult the manufacturer of the machine on any cases of serious shaft currents since he is more suited to make recommendations as to how a bearing should be insulated, or what other steps should be taken to eliminate this trouble.

Roller or ball bearings are more likely to have bearing currents and abnormal heating than sleeve-type bearings, since the contact between the bearing and the shaft is extremely good. Good contact will allow more current to flow through a given bearing for the same bearing voltage. Also the high-speed rollers or balls in the bearing will cut any flux passing from the shaft to the bearing at a high rate. This induces bearing currents within the balls or rollers themselves, causing overheating. Therefore, the amount of shaft current or flux must be smaller for roller or ball bearing operation than for sleeve bearing operation.

There have been a few cases of bearing currents caused by an external source. Widely-spaced buses carrying large direct currents can set up a strong magnetic field which may cut the shaft and thereby induce a voltage in the shaft. This in turn can generate bearing currents. Closely-spaced transposed buses will cure this condition. However, it may be necessary to demagnetize the shaft and surrounding structures when the new transposed closely-

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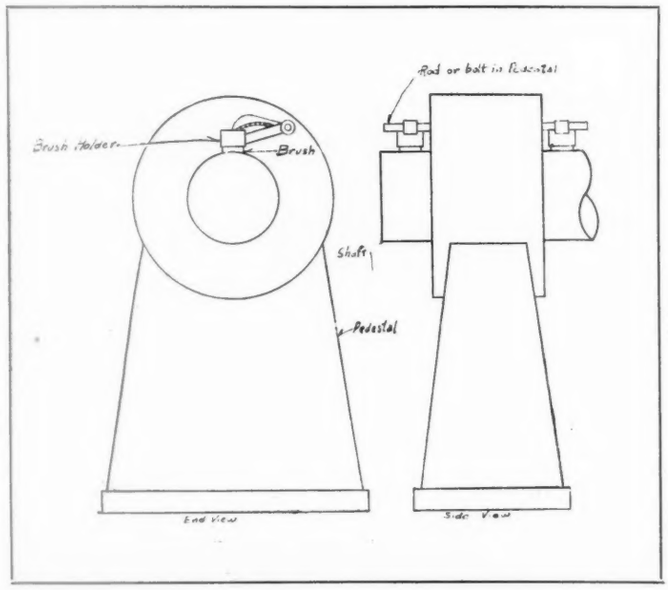


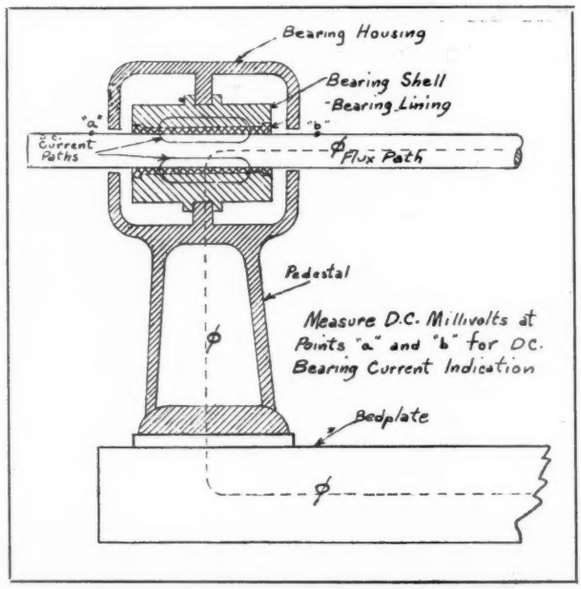
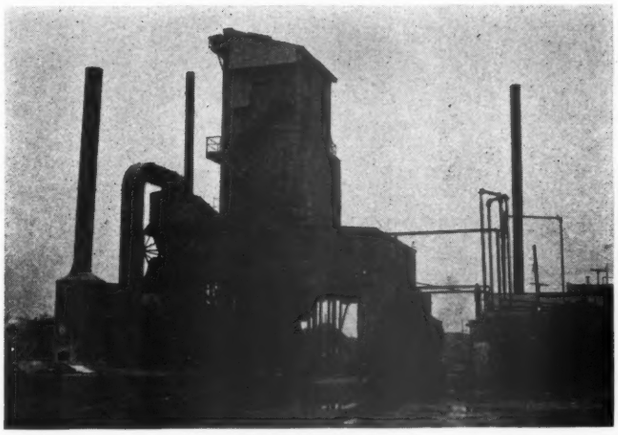
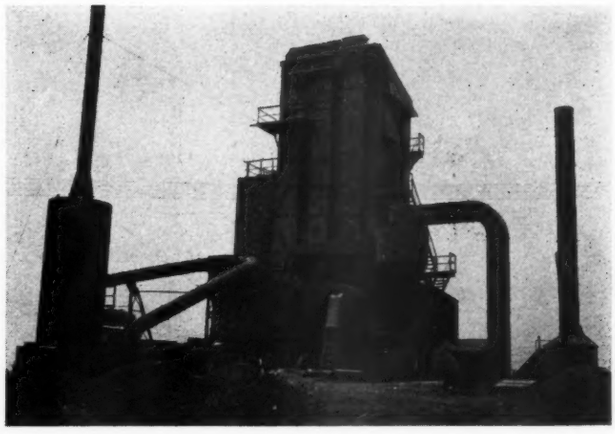


Fig. 4, Right: Path of d.-c. shaft currents produced by magnetization of shaft. Left: A.-c. or d.-c. bearing currents may be reduced to harmless values by shunting them out of the shaft with brushes attached to the bearing housing and riding on the shaft.

Adapt Aggregate-Bituminizing Plant To Changing Demands for Products



Plant of Bituminous Products Co. with new equipment at left. Boiler house and bitumen tanks are at right.



Another view showing old drier, cyclone, equipment at left. Boiler house and bitumen storage tanks are at right.

another ON THE SPOT report

THE efficient life of an aggregate-bituminizing plant has never been long, due to hard service, exposure to the weather, and the fact that the rapid advances made in operating methods and equipment made a plant obsolescent after a few years. The Bituminous Products Company built its plant at Cheektowaga, 6 miles east of Buffalo, N. Y., in 1931, near the new crushed stone plant, which the affiliated Federal Crushed Stone Corp. built in 1929. The stone plant was completely described in the December 4, 1929, issue of Pit and Quarry. The original dual plant had all Farasey equipment and was designed to produce only cold mix as N. Y. State Type 4 was then in demand.

Specifications change, however, so in 1939 they began to make, at first experimentally, semi-hot, steam-dispersion mix, an asphaltic concrete made by the steam-dispersion process. In order to make this, a Waite Associates steam dispersion chamber was installed on each of the two mixers, and Pittsburgh fluid meters with Hetherington & Berner "Brass Brain" controllers were added. With this equipment the mixers, designed to produce 80 t.p.h. of cold mix, could produce a total of 200 t.p.h. of this semi-hot mix.

For a time one unit was kept on cold mix but the demand for this soon died out. The mixers now had more capacity than the driers but by the time this was evident the war shortage of equipment was upon us. It was not until June, 1945, that a new Simplicity Systems drier and the necessary appurtenant equipment could be installed. Now all types of hot and semi-hot mixes can be made and on state and county steam-dispersion mixes the Simplicity unit has a capacity of 140 t.p.h. and the old Farasey unit of 70 t.p.h. The improved unit is used primarily for top course and the old unit for base course mixes.

By WALTER E. TRAUFFER

The improved unit begins at a 3-compartment welded steel hopper with a capacity of 30 tons. If desired the aggregates for three different types of mixes can be kept in these compartments but only two are usually stored. A Simplicity apron feeder supplies these materials as desired to a "cold" bucket elevator which discharges into the 8- by 15-ft. Simplicity double-shell rotary drier. The material enters the outer shell at one end, traverses its length and returns through the inner shell to discharge at the same end. At this end there is a No. 11 Ray steam-turbine oil burner and a combustion chamber.

The hot gases and dust are drawn from the drier through an expansion chamber or "knockout box" where some of the coarser dust drops out into the "hot" elevator hopper. Next the gases go to an 8-ft.-diameter Simplicity cyclone where more dust drops out. The gases then go through the Simplicity fan, which is driven by a 60-hp. variable-speed, slip-ring motor, into a spray settling chamber from which the residue is flumed away. The gas is exhausted to atmosphere through a steel stack. All this equipment up to the "hot" elevator was supplied by the Simplicity Systems Co.

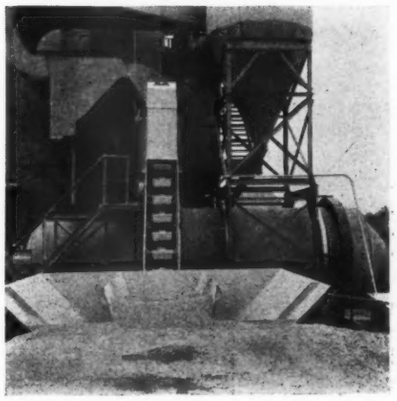
The hot elevator discharges the aggregates on a new Screen Equipment Co. "Seco" 4- by 12-ft., 3-deck vibrating screen. The various sizes produced are discharged into the four compartments of a 100-ton bin.

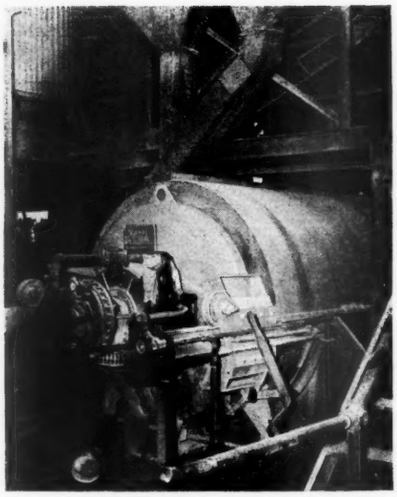
The "old" unit consists of a truck hopper, a feeder and cold elevator, a 75-in. by 30-ft. Farasey rotary drier, a hot elevator, a 4- by 10-ft., 3-deck vibrating screen and a bin.

From this point on the two circuits are identical, being the original Farasey units with additions. The aggregates are measured out for the Farasey 2-cu. yd. mixers through weighing batchers.

The No. 2 distillate and asphalt are metered into the steam chambers. The steam is then turned on

A closeup of the new double-shell drier with its hopper, cold elevator, cyclone, etc.

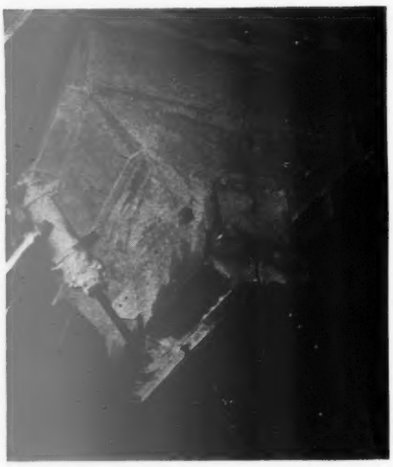




Left: The steam dispersion chamber connected to one of the two mixers. Above: The fluid meter and controller for one of the mixers. Right: The oil burner on the new double-shell rotary drier.

and the combination of heat, pressure and moisture—the asphalt temperature is 270 deg. F.—emulsifies the asphalt and accelerates the coating of the aggregates in the mixers. Without the chamber state specifications require a 4-minute mix in cold weather and 3 minutes in warm weather. With the chamber a 1-minute mix is sufficient in any season. G. E. electric timers are used on the mixers. All other operations are manually controlled.

The finished mixes are discharged through air-operated gates under the



One of the two 8-ton movable boxes for loading cars or trucks. Note air-operated discharge gate.

mixers into 8-ton-capacity Farasey loading boxes which provide surge storage so that short delays in the arrival of trucks do not delay the mixers. These also have air-operated clamshell gates. Trucks are loaded from these boxes direct in a passageway under the mixers. A track through an adjoining passageway provides for car loading and the boxes can be run on rails over to this passageway. The motors operating the travel mechanisms are controlled by electric limit switches so that the boxes can be operated by push buttons.

As most rail shipments were cold mixes little of this is now being done. Truck deliveries of semi-hot mixes are made for distances up to 80 miles. More than a dozen mixes made for private consumers are delivered in their own trucks.

The next improvement will be the installation of a larger boiler as the present unit is too small when the plant is operating at full capacity in cold weather. This boiler provides steam for heating the plant and office, the storage tanks and the jacketed liquid lines to the plant. The tanks have storage capacity for 40,000 gallons of asphalt, 20,000 gallons of naphtha, 12,000 gallons of No. 2 distillate and 20,000 gallons of No. 4 fuel oil.

On the property also are tanks with a combined capacity of 95,000 gal. for the affiliated Allied Bitumen, Inc. This firm is a distributor of bituminous materials including asphalt road oils and emulsions, and operates eight distributing trucks for delivering and placing these materials.

The Bituminous Products Co. also operates a 1-ton capacity aggregate-bituminizing plant at the Lackawanna slag plant of the affiliated Buffalo Slag Co.

Another 2½-ton plant at Clarendon, Pa., has not been operated since 1940. As this plant has no drier, dried stone is shipped to it in covered cars. A 2-ton plant mounted on railroad cars was used during the war on different vital projects and is now stored in the Lackawanna yard. All these operations are under the supervision of William Tarbell, vice president.

Method Is Developed

(*from page* 72)

spaced bus is installed to eliminate the effects of old residual magnetism. Shunting brushes, mentioned above, will help prevent damaging currents in the bearings.

A grounded coil on the rotor of a machine may cause current to flow through a bearing. Periodic insulation-resistance readings on each machine would detect this condition, possibly before any damage materializes.

Ground currents flowing through the foundation of the building may flow up through the parallel current path formed by the bearings and shaft of the machine. A low-resistance foundation or grounding cables would help remedy this type of trouble.

In general, bearing currents may be generated by many sources. The best procedure to follow is one of elimination. Eliminate each possible source as the investigation proceeds. First, make a complete bearing inspection and then check the machine, using the sparking test. Investigate the possibility of a.-c. or d.-c. bearing currents generated by the machines themselves and eliminate or remedy this if required. External causes should then be looked into if necessary.

An editor had cause to admonish his son because of the lad's reluctance to attend school.

"You must go everyday and learn to be a great scholar," said the fond father, "otherwise you can never be an editor, you know. What would you do, for instance, if your magazine came out full of mistakes?"

"Father," was the reply, "I'd blame the printer." And the father wept with joy, because he knew he had a successor for the editorial chair.

Iowa Agricultural Limestone Assn. Considers Industry's Major Problems

another ON THE SPOT report

THE annual meeting of the Iowa Agricultural Limestone Association was held at the Kirkwood Hotel in Des Moines on February 22 with some 30 members and guests in attendance. With 182 prospective members in the state, this new association, although less than a year old, now numbers 26 member companies, and the list is growing steadily.

The meeting unanimously approved the action of the board of directors in selecting Clint A. Allen of Des Moines to serve as the association's permanent full-time executive secretary, effective April 1. Mr. Allen, who has been directing the affairs of the association on a part-time basis, will open offices in Des Moines in the very near future. He brings to his new duties a wide experience in business and industry in the state of Iowa. Since 1942 he has been employed by Sargent Brothers, crushed-stone producers of Des Moines.

Paul M. Nauman, retiring president of the association, reported to the meeting on some of the more important problems confronting producers. He mentioned in particular the growing competition of consumer's cooperatives which pay no taxes and are frequently backed by public funds, using their profits for expansion or to pay dividends to members. Mr. Nauman stated that only a strong association could effectively shield the industry from such competition.

The speaker mentioned also the problem of suits for back wages under the Wage and Hour Act, pointing out that at present there is no statute of limitations in regard to such suits. He urged members to give their support to legislation now pending in Congress to curb this very serious threat to industry.

Left to right (seated): S. P. Moore, chairman, Agricultural Limestone Division, N.C.S.A.; W. F. Sharpe, newly elected president of the Iowa association; Clint A. Allen, executive secretary of the organization. Left to right (standing): Paul M. Nauman, Don Kaser, E. F. Schildberg, Ernest I. Sargent and Vern Schield, directors.

In closing Mr. Nauman paid tribute to the United States Soil Conservation Service and expressed the hope that the association would avail itself in every possible way of the fine work being done by this organization.

Principal speaker at the Des Moines meeting was S. P. Moore (Concrete Materials and Construction Company, Cedar Rapids, Iowa,) who was elected chairman of the Agricultural Limestone Division of the National Crushed Stone Association at the annual convention in Cincinnati in January. Mr. Moore reviewed the high spots of the Cincinnati meeting for the benefit of those in the audience who were not able to attend it. He mentioned in particular the implication in such a meeting that agstone is no longer a sideline business but has become a full-fledged industry in its own right. Agstone producers, Mr. Moore said, can take justifiable pride in the important contribution which they are making to the national economy.

Mr. Moore urged the adoption by the industry of advertising and promotional programs in anticipation of the day when a slackening of Federal support for the liming program may cause a drop in demand. In this connection he pointed out that very few expenditures by the Federal government are more widely beneficial than those made under the A.A.A. program, and that a vigorous soil conservation program is more important today than ever before in history.

The speaker referred to the discussion at Cincinnati of the program of the Federal Reserve banks to interest country banks in soil conservation, and urged Iowa producers to avail themselves of this excellent medium for promoting the

Left: P. A. Dooley, River Products Co., Iowa City, and Frank B. Kennard, Carney Co., Inc., Crushed Stone Division, Mankato, Minn. Right: Carl Chadek, Chadek Trucking Service, Iowa City, and Ben Ravitz, Concrete Materials & Construction Co., Ottumwa.

use of their materials. Whether or not such a program would result in an increase in bank loans to Iowa farmers, Mr. Moore said, it provides an excellent means of getting the message across.

Mr. Moore disclosed that Iowa has a larger representation than any other state in the Agricultural Limestone Division of the National Crushed Stone Association, and he pointed out that the cost of membership could be more than offset in most cases by utilization of advertising and promotional material furnished by the Division. Individual efforts in advertising, he said, are not only very costly and time-consuming, but are too often ineffective.

At the conclusion of the meeting W. F. Sharpe (Dillon, Sharpe & Company, Centerville, Iowa) was elected president of the association for 1946, succeeding Paul M. Nauman. Harry D. Bellamy, (Concrete Materials & Construction Company, Cedar Rapids, Iowa) was re-elected vice president. In addition to Mr. Sharpe and Mr. Bellamy, the board of directors for 1946 includes Vern Schield, Ernest I. Sargent, E. F. Shildberg, Don Kaser, Paul Nauman, G. B. Clarke and C. A. Allen.

Those present at the meeting were: Vern Schield, Waverly; Carl Chedek, Iowa City; Ben Ravitz, Ottumwa; E. W. Knapp, Des Moines; Leo Bruening, Decorah; L. R. Falk, St. Ansgar; E. F. Schildberg, Greenfield; E. I. Sargent, Des Moines; S. P. Moore, Cedar Rapids; K. K. Kinsey, Cedar Rapids; H. E. Millen, Douds; Ernie Talbert, Centerville; P. M. Nauman, Dubuque; W. D. Dillon, Centerville; W. F. Sharpe, Centerville; F. B. Kennard, Mankato, Minn.; Paul Templeman, Des Moines; John Stark, Girard, Kans.; Elmer Kaser and Don Kaser, Adel; Ray Cook, Sr., Ames; Ray Cook, Jr., Decorah; P. A. Dooley, Iowa City; Clint A. Allen, Des Moines; William M. Avery, Chicago; and Russell Rockvald, Decorah.

So. California Producers Hear Ahearn Discuss Washington Scene

another ON THE SPOT report

By HARRY F. UTLEY

EIGHTY Southern California producers of sand, gravel and ready-mixed-concrete and guests gathered in the Music Room of the Biltmore Hotel in Los Angeles on February 26 at a luncheon hon-

Vincent P. Ahearn

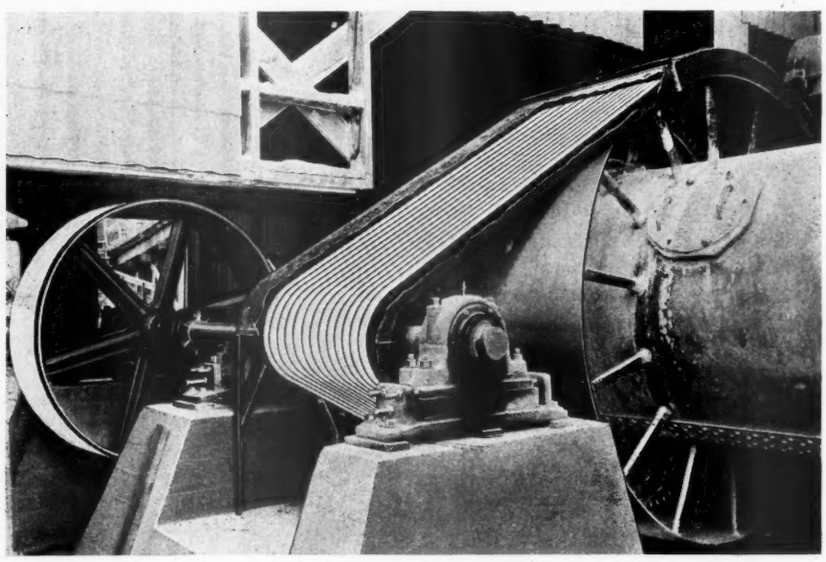
oring V. P. Ahearn. Mr. Ahearn, who was enjoying a well-earned vacation from his duties as executive secretary of the National Sand & Gravel Association and the National Ready Mixed Concrete Association, Washington, D. C., had been similarly honored during the previous week by producers in the San Francisco area while he was spending a few days in the city by the golden gate.

Paul Graham, president of Graham Brothers, Inc., Los Angeles, presided at the meeting and Mr. Ahearn was introduced by Robert Mitchell, president of the Consolidated Rock Products Company, Los Angeles.

Mr. Ahearn devoted much of his talk to an interpretation of the Washington scene with which he is in close touch. He pointed out some of the incipient dangers which lie ahead for industry, particularly in the relations between labor and able time as well to an analysis of management. He devoted considerthe Schroeder case in Texas wherein a higher court recently overruled a decision of a district court holding that employees of aggregates producers were subject to the provisions of the Fair Labor Standards Act.

Twenty-two southern California producers were represented at the Los Angeles gathering. They came from San Diego, Riverside, San Bernardino, Bakersfield, and Ventura County.

Among the guests were two well-known producers from other sections of the country who were enjoying winter vacations under the California sun. They were John Prince, head of the Stewart Sand & Material Company of Kansas City, and "Bud" Spratlen of Denver.



The application of a completely enclosed Gates V-belt-pulley assembly has solved the abrasion problem of the Pioneer Silica Company of Pacific, Missouri. The severe abrasive wear from silica dust on the bull and pinion gears on the second reduction of the drive to a tube mill resulted in production delays and high maintenance costs. As a solution to the problem a large flat pulley was created by welding one edge of a wide steel band to every other tooth on the bull gear and supporting the other edge with spokes welded to the mill drum. A housing further protects the belts from the silica dust. The jackshaft was mounted so that it could be moved for belt take-up.

RECENT DEVELOPMENTS IN THE DRILLING OF LARGE BLAST HOLES

Part I

By L. B. BIRKHEAD
Drill Sales Manager, Bucyrus-Erie Co., South Milwaukee, Wis.

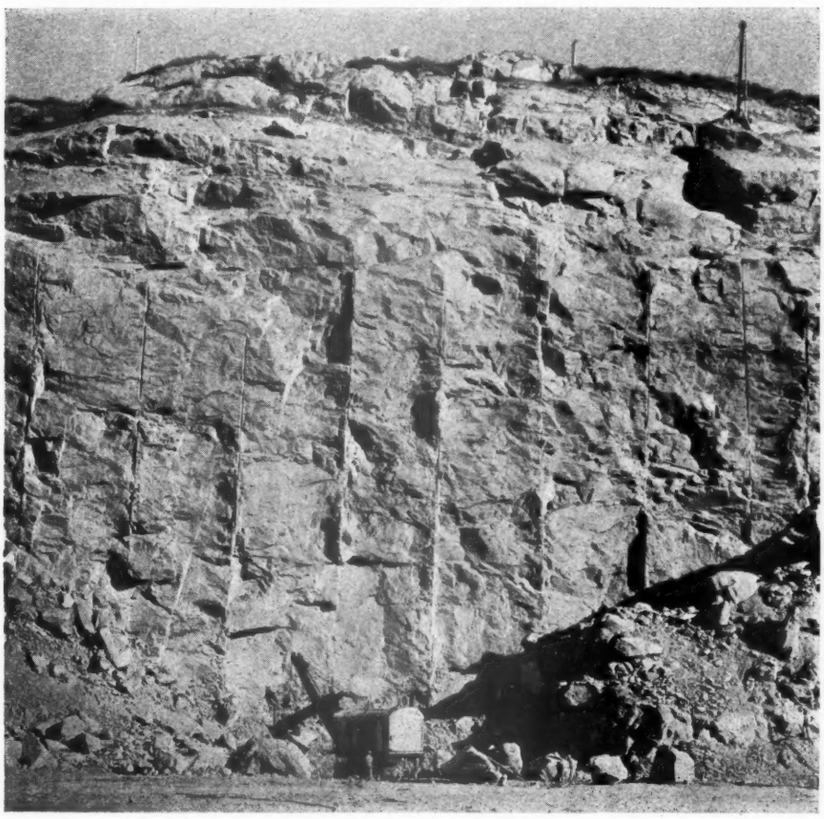
THE inadequate capacity for explosives provided by small diameter (1½- to 3-in.) air-drilled blast holes in rock and hard ore demanded the development of improved methods which led to the use of so-called "well drills" to obtain a larger-diameter hole with greater capacity for explosive. Air-drilled blast holes require tapering to a small diameter at the bottom necessitating closer spacing or springing. With adoption of the well drill the hole diameter was originally increased to about 6 inches, with a resulting increase in explosive capacity of 400 to 900 per cent. per foot of hole drilled. The 6-in. dia. holes were drilled the same size from top to bottom and column loaded without springing. The use of the well drill also permitted the drilling of holes to any required depth in making deep cuts or high working faces, whereas the use of air drills is limited to approximately 30-ft. depths. The well drill holes may be carried to depths of 200 feet or more.

The well drills first used for this bigger hole drilling were of a type developed for water well work and not specially designed to adequately meet the requirements of severe service in mines and quarries. The comparatively successful performance and lower drilling costs (per ton) obtained with well drills brought about the development of a special-purpose drilling machine for blast-hole drilling exclusively. This blast-hole machine differed from the well drill in features of design, which were necessary to meet the requirements in mines and quarries such as crawler mounting, added strength for continuous hard drilling, and means for guiding the drill tools when starting the hole. Further experience brought about the incorporation in the design of blast hole machines, additional features to further improve their efficiency, such as all-steel welded frame, rubber insulation and rubber shock absorbers permitting the use of steel drilling cable, operating platform with built-in tool wrenches, and on the larger machines, hydraulic jacks for quick leveling of machine at the hole location. The modern blast-hole drill moves over the ground under its own power with ease and safety, with its crawler mounting, in minutes, as compared with hours required to move and locate the old well drill. In starting blast holes at the rock surface, tool guides at platform level and on the derrick control the tools and permit operation at maximum speed from the start of the hole. The all-steel electric-welded frame construction has proved its ability to stand up under the severe service and eliminates high depreciation and maintenance experienced with well drills of wooden frame construction. Sheaves with rubber-cushioned rims reduce materially the effects of vibration set up by the impact of the drilling tools, and the rubber shock absorber under the crown sheave at the top of the derrick provides resiliency to permit the use of steel drilling cable, with a resulting saving of as much as 75 per cent. The operating platform with built-in tool wrench not only facilitates tool changes but also provides important safety first protection for workmen by eliminating the necessity of handling heavy tool wrenches.

Blast hole drilling in many mines and quarries is not considered a major factor in the operation, with the result that production costs are not as low as they should be. This is accounted for in many instances by

L. B. Birckhead

An example of 9-in. hole drilling.



the fact that the loading, transportation and processing of the product has received first attention insofar as efficiency and lower costs are concerned.

Analyzing the functions of the drilling machine with a view of determining the results which should be expected is almost a sure way to achieve material savings in operating costs. In making such an analysis, two major determining factors for maximum blast-hole-drilling efficiency are:

1—The ability of the drilling machine to produce maximum energy at the bottom of the drill hole.

2—Shape of drill bits and heat treatment of bit steel to convert energy to useful work and footage drilled.

There are of course other factors to be considered, such as skill of the operator and general organization efficiency, on which no comment is necessary.

The ability of any churn-type drill to produce energy is largely dependent upon the weight of drilling tools, the length of tool travel and the number of strokes per minute. This data is readily obtained by weighing the tools, measuring the length of tool travel at ground level, and by timing the revolutions of the crank pin. For example, it is frequently found that old-style machines use a string of drilling tools weighing about 1100 pounds and operate with a tool travel of 28 inches at 60 r.p.m., producing theoretical energy equal to 1100 lb. $\times$ 28/12 $\times$ 60 = 154,000 foot pounds per minute.

As a comparison, a modern drilling machine using wire drilling cable, under similar conditions, will operate with 1800 pounds of drilling tools with a tool travel of 40 inches at 54 r.p.m., developing theoretical energy equal to 1800 $\times$ 40/12 $\times$ 54 = 324,000 foot pounds per minute.

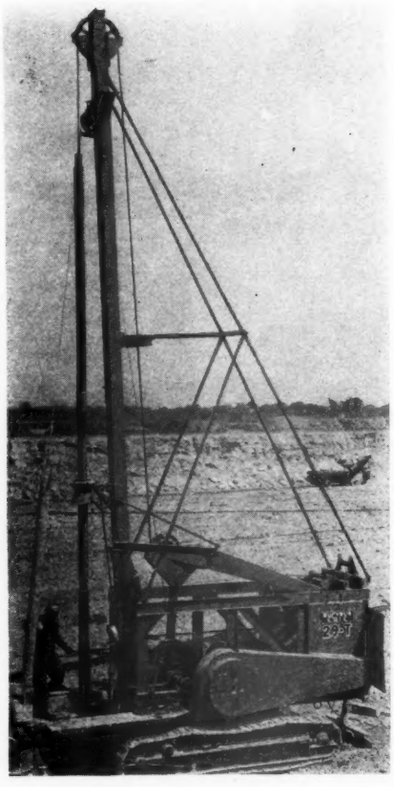
It is noted that the theoretical energy produced by the modern machine is more than double that of the old-style well drill, a fact which is reflected in the footage drilled in hard rock formations. In softer formations the increase in footage drilled is less, because the additional energy developed is not necessary to rapidly penetrate the formation. In other words, the harder the rock formation, the greater the improvement in footage drilled with the modern blast-hole drill.

The second of the determining factors for maximum blast-hole drilling efficiency which deals with the shape of drill bits and heat treatment of bit steel will be taken up in the second installment of this article for this applies regardless of hole diameter.

For a number of years the well-drill type of machine was used for drilling 6-in. blast holes in mines and quarries, but with the advent of the modern all-steel blast hole drill, it was possible to materially increase the weight of the drilling tools and drill larger diameter holes with equal or greater rate of progress. The next step in this direction was the use of 8-in. dia. holes, which was subsequently increased to 9-in. dia. to make it possible to use a larger tool joint, necessitated by the heavier tools, and at the same time allow proper clearance for tool travel.

The advantages of the 9-in. dia. blast holes, as compared with 5⅝- or 6-in. blast holes are as follows:

1—The 9-in. dia. hole has capacity for explosive 120 per cent. greater than a 6-in. hole, thereby making possible an increase in hole spacing and burden. Current practice is to increase spacing about 50 per cent. compared with spacing possible with 6-in.-dia. holes; in other words, with the wider spacing of 9-in.-dia. holes the explosive is increased 120 per cent. per foot of hole and does its work at only 50 per cent. greater distance as compared with 6-in.-dia. holes; therefore better fragmentation is assured and less secondary blasting should be required. See Figure "A".



A modern blast-hole drill.

2—Greater capacity for explosives makes it possible to place a greater charge at the bottom of the 9-in.-dia. hole, where it is most effective. Springing of holes can in most cases be eliminated.

3—Cost per foot of drilling 9-in.-dia. holes with modern blast hole drills is equal to or less than the cost of drilling 6-in.-dia. holes. Drilling progress with a modern blast hole machine drilling 9-in. holes is equal or greater than for drilling 6-in. holes, due to the use of heavier tools in the larger hole. Therefore the cost is about the same per foot of hole drilled because labor is the principal element of cost.

4—Fewer 9-in.-dia. holes are required to produce the same tonnage of rock broken as compared with 6-in.-dia. holes, on account of the greater volume of rock broken per foot of hole. This reduces hole loading costs, supervision, etc.

5—The cost of explosives is not greater when using 9-in. holes as compared with 6-in. holes, as the same explosive ratio is used in figuring the amount of explosive to be used.

6—In drilling, where difficulty and delay is experienced with crooked holes and tools sticking, the 9-in.-dia. hole has greater advantages, as such delays are eliminated or materially reduced because of the heavier tools used, and the larger hole area which enables tools to cut across seams without deflection of hole.

Advantages of 9-in.-dia. holes as compared with smaller-diameter holes have been proven in the field, as evidenced by the fact that there are approximately 400 modern blast hole machines drilling 9-in.-dia. holes in quarries and mines in the United States and foreign countries.

The following information relative to the advantages of 9-in.-dia. blast holes on many operations may be of interest.

In 1931 experimental drilling of 9-in.-dia. blast holes was carried out in a large New York State quarry with satisfactory results. The rate of drilling progress of the larger hole equaled that obtained with a well drill drilling 6-in. holes.

In 1935 a large copper mining company adopted blast hole machines drilling 9-in.-dia. holes (formerly 3-in. holes were used) on a 32-ft. face. The reduction in cost

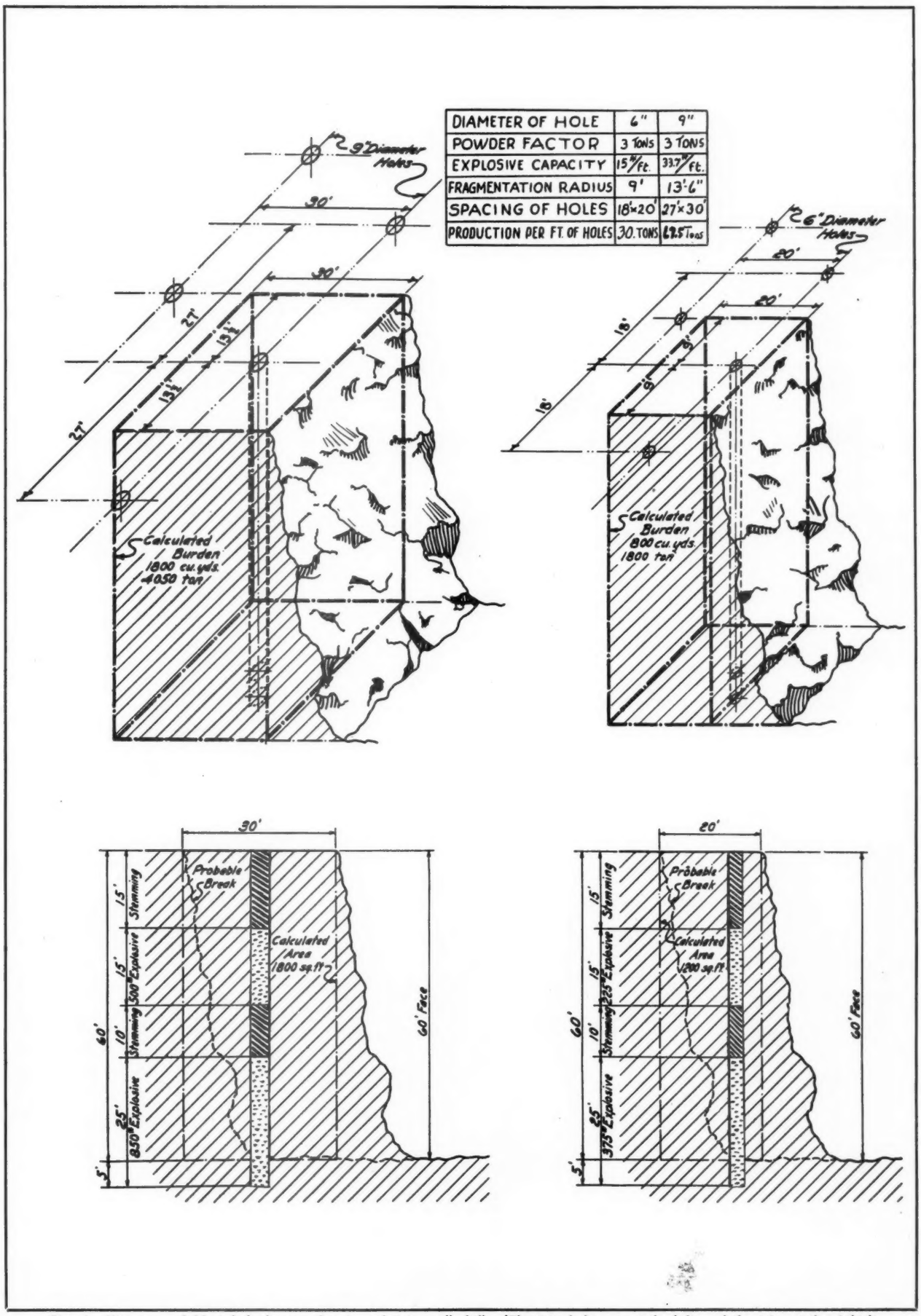


Fig. A. Diagrams of blast hole layouts for 9- and 6-in. well drills. (The 9-in. holes are at the left, and the 6-in. at the right.)

of primary drilling was about 50 per cent. with satisfactory fragmentation.

In 1937 a large iron mining company in Michigan conducted experimental drilling of 9-in.-dia. blast holes and a comparison of results is shown below:

Diameter of holes	6 in.	9 in.
Height of face, approximately	100 ft.	100 ft.
Hole spacing	15 ft.	20 ft.
Burden	22 ft.	30 ft.
Rock drilled per foot of hole	25 tons	45 tons
Cost per foot of hole drilled	1.85	1.50
Cost per ton of rock blasted	0.074	0.0334
Powder factor, tons per pound of explosive	3.8	3.04

It will be noted the powder used in this experimental shot was increased for the 9-in.-dia. holes in order to avoid possibility of unsatisfactory fragmentation. The actual results showed an improvement in fragmentation and a reduction in secondary drilling and blasting costs. As a result of this experiment 9-in.-dia. holes on wide spacing were adopted on this operation.

In a coal stripping operation in Illinois the following results were obtained.

Diameter of holes	6 in.	9 in.
Hole spacing	19x20	24x27
Overburden drilled per foot of hole	14.07 cu. yd.	24 cu. yd.
Increase	70%	
Fragmentation radius	9 ft. 6 in.	12 ft. 0 in.
Increase	26.3%	

As a result of better fragmentation and displacement and heaving of the limestone overburden, the efficiency of the stripping shovels was materially increased.

In a cement quarry in Missouri the increase in footage of 9-in.-dia. hole drilled was found to be about 9 per cent. as compared with 6-in.-dia. hole. Spacing of holes was increased from 15 by 15 ft. for the 6-in.-dia. holes to 20 by 20 ft. for the 9-in.-dia. holes, with an increase in production of 92 per cent.

A comparison in 1944 is the following from results obtained by a Minnesota iron mining company in drilling rock overburden with a medium-size machine drilling 6-in.-dia. holes, and a larger unit drilling 9-in.-dia. holes:

COMPARISON—6 ft. and 9 in. Hole Drilling			Increase
Diameter of hole	6 in.	9 in.	
Hole drilling	700 ft.	700 ft.	
Spacing of drill holes (approximately)	18x23 ft.	24x32 ft.	
Fragmentation radius	9 ft.	12 ft.	+33⅓%
Depth of holes	30 ft.	30 ft.	
Rock per foot of hole drilled, cu. yds	15.1	28.2	+87%
Rock—total—cu. yds	10600	19700	+86%
Drilling progress, Ft./Hr	4.33	4.87	+12.5%
Bit footage	7.8	14.00	
Drilling cost—per foot of hole	0.49	0.52	+6%
per cu. yd. rock	0.325	0.186	—57%

In a recent article in a coal mining trade journal describing a large stripping operation in the anthracite coal fields of Pennsylvania, the following quotation will be of interest:

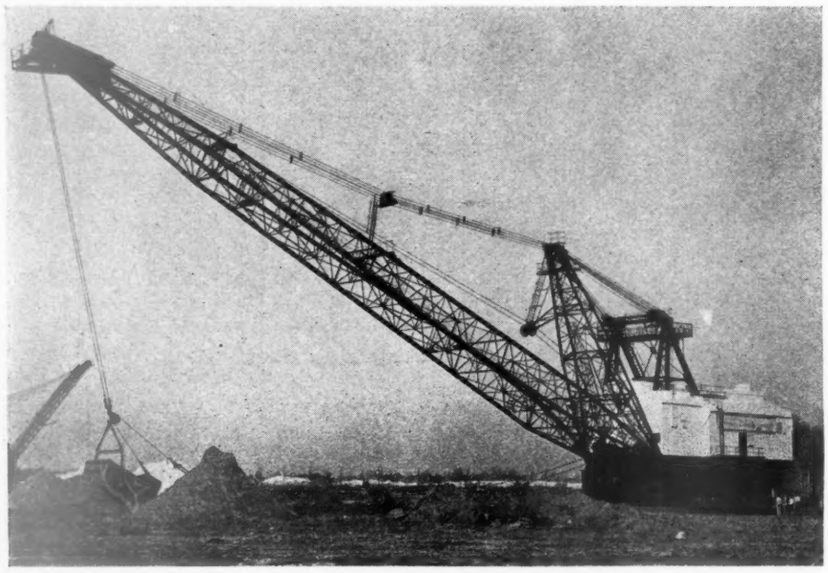
"Big blast hole drilling with the 9″ drill is now in extensive use in strip mining in the anthracite field. The (mine) staff is firmly convinced of its many advantages and is looking confidently to further improvements with still larger drills. The overall results being obtained at (this) stripping are in large measure attributable to the use of larger drilling equipment and to the careful control over blasting procedure."

From the foregoing data it is evident that material savings in primary drilling costs can be made in many quarries if larger diameter blast holes are drilled. It is not claimed that the 9-in.-dia. hole can advantageously be used in every quarry or mine, because in many instances it is not possible to take advantage of the greater capacity for explosive by wider spacing and burden, due to the character of the formation, or other factors such as limitation of total explosive charge, etc. It is, however, our opinion that the many mining and quarry operators should give consideration to drilling 9-in.-diameter holes by investigating the possibilities for their primary drilling.

(To be continued)

1,000,000 Tons of Phosphate per Year Expected From New International Operation in Florida

ACCORDING to an announcement by Louis Ware, president of International Minerals & Chemical Corporation, the company has just completed negotiations for the purchase of a phosphate rock deposit near Bartow, Florida, which will be developed into the largest and most modern phosphate mining operation in the United States.



Another "world's largest"—the gigantic dragline excavator now in use at the International phosphate mine near Bartow, Fla. Note the figures at the extreme right, dwarfed by the dragline's huge housing.

Purchase of the property, involving about 2,000 acres of land, was negotiated on behalf of International by Franklin Farley, vice president in charge of the phosphate division of the corporation, who said that it is planned to construct immediately a phosphate mine operation that will have a life of more than 25 years and which is expected to yield the greatest annual tonnage of high-grade phosphate rock ever mined from a single deposit. The project will be highly mechanized and designed for highest efficiency and lowest cost production.

The new plant near Bartow, scheduled for completion in July,

will have an annual capacity of 1,000,000 tons, and will incorporate a number of design innovations which it is thought will bring about the highest recovery rate in the history of the industry. In addition to the 2,000-acre deposit, a smaller mine with a capacity of 300,000 tons annually will be developed in the vicinity of Bartow.

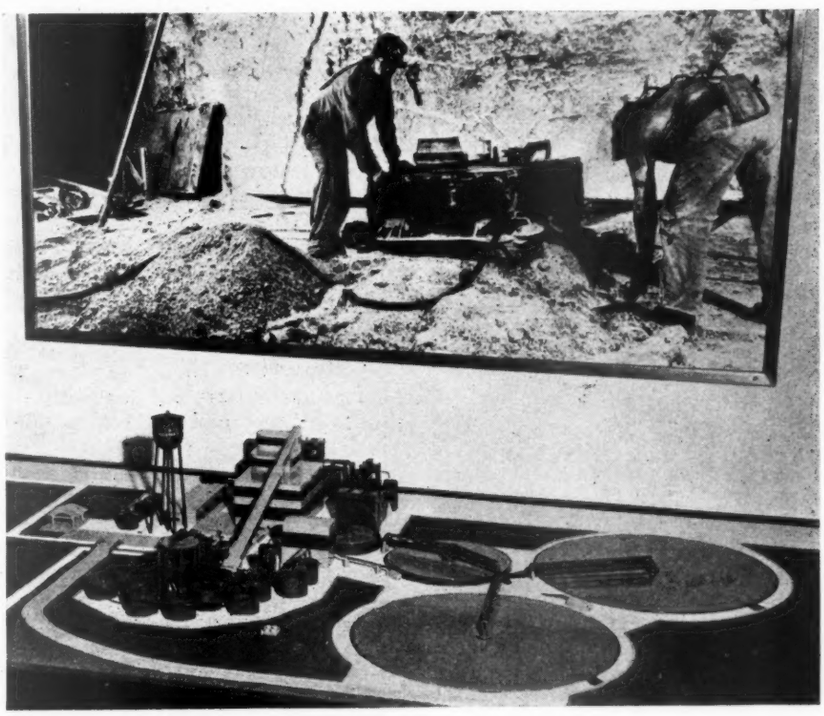
In discussing some of the mechanical features of the corporation's phosphate mining activities in Florida, Mr. Farley stated that the largest dragline excavator ever built is now in operation at International's present Peace Valley Phosphate mine near Bartow. PIT AND QUARRY carried the first announcement of this machine in the March, 1944, issue. Built by Bucyrus-Erie at Milwaukee, the 1150-B digger required 52 railway cars to transport its total weight of 2,571,000 pounds. The bucket has a struck measure of 21.4 cubic yards and will handle approximately 3,850,000 pounds of rock per hour. The 215-foot boom is about 35 feet longer than any built heretofore.

The 1150-B has a walking traction with a 50-foot diameter circular tub or base which gives it relatively low bearing pressure. The walking "shoes" are 54 feet long and 9 feet wide.

The electrical equipment includes two motor-generator sets, one with a 500-horsepower induction driving motor, the other with a 1,250-horsepower synchronous driving motor. All the functions of the machine are independently operated by more than 30 electric motors including: 2 hoist motors, each 425 horsepower; 2 drag motors, each 425 horsepower; and 3 swing units, each having a 125-horsepower motor. Air for ventilating the motors is taken in through a ventilating room to filter out the dust, dirt, insects, etc., before the air reaches the motors. An order has been placed for a similar piece of equipment for the new mine near Bartow, and it is anticipated that the second digger will be placed in operation sometime this summer.

Before ocean shipping was stopped by the war, Florida phosphate mines shipped about 1,000,000 tons annually to European and Far Eastern markets. With such shipments now six years in arrears, demand for phosphate for export will remain at a high peak for many years. Domestic demand has increased at a steady rate since the first production began in the Florida fields some sixty years ago, and the actual needs, both foreign and domestic, are today far in excess of capacity. International's 1,300,000 tons of new capacity is therefore urgently needed to rebuild depleted farm lands throughout the world, to the end that it may before long be possible for other nations to produce sufficient food for their own needs.

Louis Ware
President, International Minerals & Chemical Corp.



Right: This scale model of the International Minerals & Chemical Corporation's new recovery plant is on display at the corporation's home office in Chicago. It will be known as the Noralyn Plant. The ponds are 350 feet in diameter.

1945 U. S. Cement Output Shows 13 Per Cent. Rise—Foreign Exports Increase

Total shipments of 106,398,000 barrels of Portland cement in 1945 represent a 13 per cent. increase over the quantity reported for 1944. The larger output in 1945 is spread over exports represented by shipments to foreign countries and non-contiguous territories of the United States and all the states except California, Delaware, Kansas, Kentucky, Nebraska, North Carolina, Rhode Island, Tennessee, Virginia, Washington and Wyoming.

Shipments to foreign countries, a large portion of which represent material purchased by the armed forces for use overseas, account for 25 per cent. of the overall increase.

Texas, New York, Michigan and Pennsylvania received shipments totalling 4,150,672 barrels, or an additional 34 per cent. of the reported 1945 increase. The remaining 41 per cent. of the overall increase is spread over the other states.

Gypsum Makes Comeback In U. S. During 1945

Despite price difficulties and shortages of labor and materials, the gypsum industry as a whole recovered in 1945 from the wartime low of 1944, according to reports of producers to the U. S. Bureau of Mines. Small increases were attained in both mined and calcined gypsum, the generally accepted barometers of the industry. Receipts of Canadian gypsum were the highest since 1941.

sylvania received shipments totaling showed increases, although sales of some low-profit items and temporary structure materials declined.

MILLARD FINDS MODERNIZED HAULAGE AND CRUSHING METHODS PROFITABLE

ON THE SPOT REPORT

WE HAVE pointed out before in these pages that quarry haulage methods and general practices are undergoing modernization on an unprecedented scale throughout the country. More and more operators are realizing that profits are won or lost in the quarry and are taking definite steps—usually at considerable expense—to increase efficiency in this vital part of their operations.

By WILLIAM M. AVERY

H. E. Millard, Annville, Pennsylvania, began modernizing haulage practice in 1942 when the first Model 36FD quarry-type rear dump Euclid trucks were placed in operation. These units have a rated payload capacity of 15 tons and are powered by 150-hp. Cummins engines. Prior to that time, with the exception of a few spasmodic experiments with dump trucks, the full load had been carried with Austin-Western 6-ton side-dump cars operating on a narrow-guage track. The work of maintaining tracks to handle recovery operations in three pits—strung out east and west for almost 1½ miles and connected by tunnels—finally became too heavy a burden, and the shift to truck haulage was begun.

Today the company operates nine Euclids in all and under normal operating conditions 75 per cent. of the total tonnage is moved by truck and 25 per cent. by the side-dump cars. Since the primary crusher is located in the most westerly of the three pits, the Euclids are used exclusively for the long haul from the east pit, as well as from a low point in the west pit where the grade mitigates against track haulage. The cars are drawn by a Plymouth gasoline-powered locomotive.

Truck backing to original primary crusher. Steel framework for runout belt conveyor and loading bin had been just completed.

General view in the west quarry of H. E. Millard, Annville, Pa., showing the new primary crusher building.

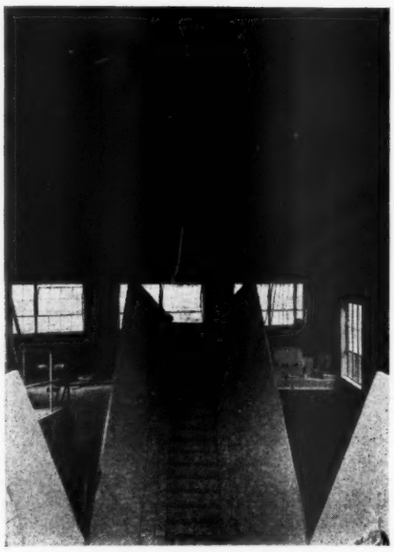
A new primary crushing setup was in process of installation when we visited the Millard plant and has since gone into operation. It consists of a Kennedy-Van Saun No. 30 gyratory crusher fed through a 2½-inch grizzly by a 42-inch by 32-foot Link-Belt apron feeder. The feeder is so situated with respect to the roadway that trucks can dump to it from either side and cars from the end. The installation is housed in a structural-steel-frame building with bonded corrugated steel siding, and is particularly remarkable for the generous amount of space provided for the equipment. The entire installation is in full accord with the owner's long standing policy of using only the most modern equipment throughout the plant and brings the quarry in step with the outstandingly efficient rotary lime-kiln plant.

Temporarily the stone from the new primary crusher is being discharged by a 36-inch inclined belt conveyor into bins for reloading into trucks which haul to the plant above the quarry. Eventually, however, the belt conveyor will be extended to the top and will feed an entirely new washing and screening plant which the company plans to build. With the new primary crusher the capacity of the quarry now considerably exceeds the secondary crushing and screen capacity of the existing plant. Ultimately the company's overall capacity will be more than doubled.

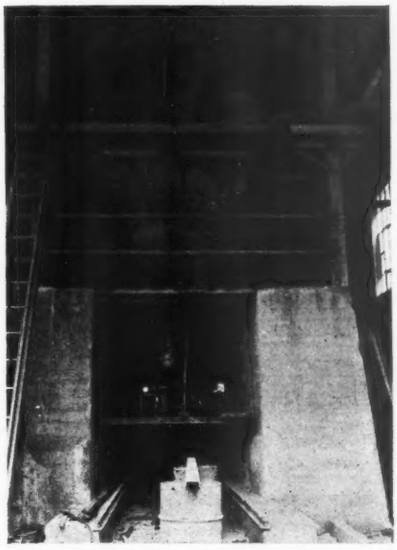
About a year ago this company completed a 75- by 208-foot concrete block building to house plant offices, machine shop, laboratory, lockers, showers and other facilities. One of the best-designed structures of its kind to be found anywhere in the industry, it marks a new high in the provision of excellent working conditions for employees.

H. E. Millard is one of the few sizable concerns in business today

The 42-inch by 30-foot apron feeder for the new primary crusher.



that is wholly owned by an individual. It dates from 1880 when a small flux stone plant was started on the site by J. B. Millard, father of the present owner. In 1937 H. E. Millard completed and placed in operation a rotary-kiln lime plant which at the time was undoubtedly the most modern plant of its kind. A second rotary kiln was installed a few years later. This plant was completely described in the August, 1937, and June, 1940, issues of PIT & QUARRY.



The new gyratory crusher before installation had been completed.

National Gypsum Company Pushes Expansion Program

A vast National Gypsum Co. expansion program currently in progress at several plants is making the headlines in various localities. (See PIT AND QUARRY, January, 1946.) At Mobile, Ala., nearly $1,000,000 will be spent to increase production; and at Savannah, Ga., capacity will be increased by one-third. An addition being erected at Rotan, Tex., will also step up tonnage. New installations scheduled for the company's three rock wool plants include drying ovens, cupolas and other equipment.

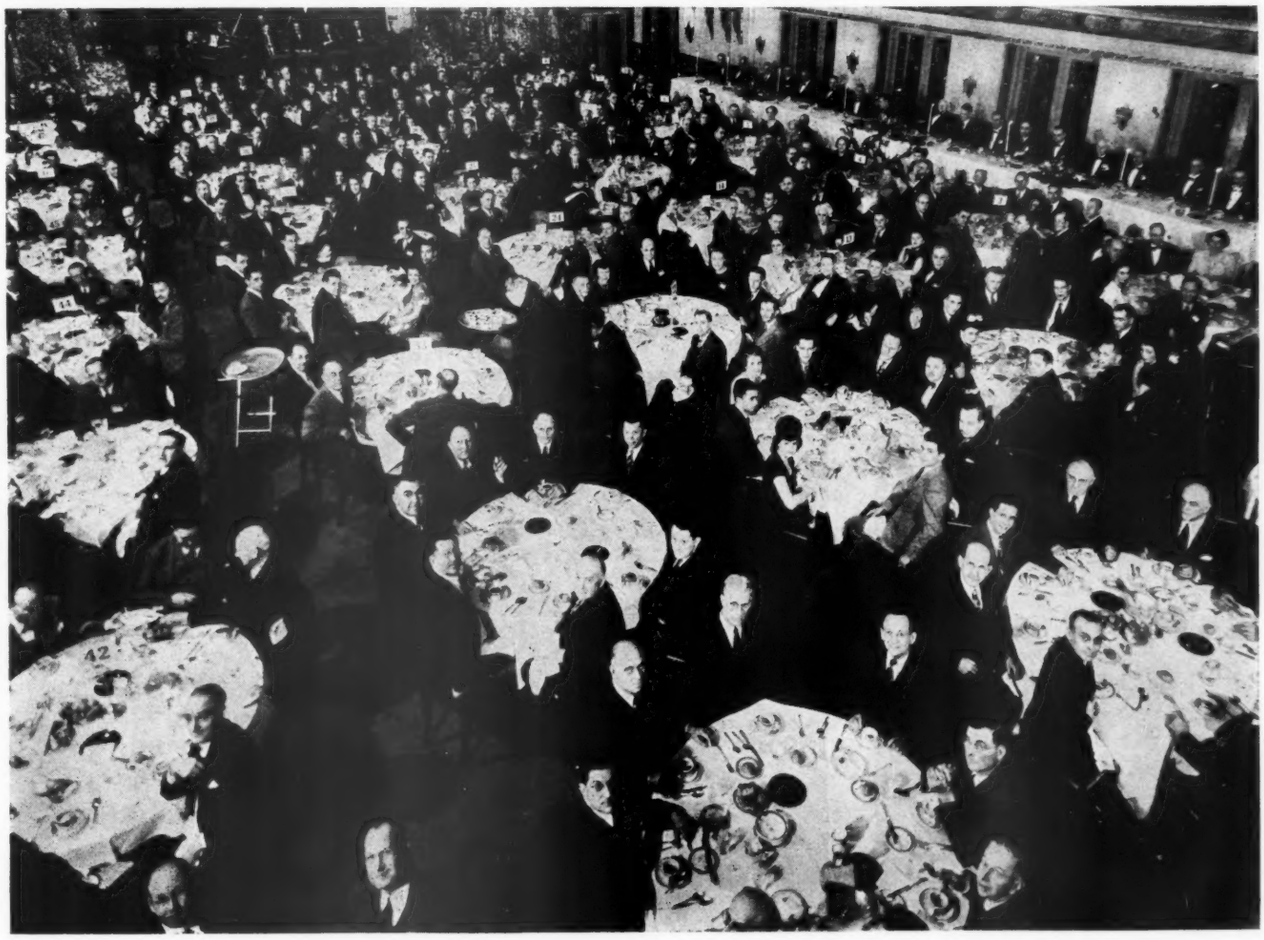
The Dingwall operations in Nova Scotia have been consolidated and loading facilities have been improved. In addition to the two cargo vessels acquired for carrying gypsum rock from Canada to seaboard plants in the United States, a third has been chartered.

Units at Medicine Lodge, Kans., Clarence Center, N. Y., and Akron, O., are also scheduled for improvements. A new quarry recently opened at the company's Fort Dodge, Iowa, plant is expected to reduce the cost of mining there.

N. C. S. A. and Agstone Division 1946 Convention Photographs

Because the closing date of the March issue of PIT AND QUARRY closely followed the conventions of the National Crushed Stone Association and its Agricultural Limestone Division in Cincinnati, a number of interesting photos had to be omitted from the staff writeups in that issue. These photos are presented on this page and the one following. The photo below was taken at the annual banquet of the N. C. S. A. and those on the next page are portraits of speakers at both conventions and others connected with the meetings.

The picture below shows a scene at the annual banquet of the National Crushed Stone Association at the Netherland Plaza Hotel in Cincinnati on January 30. Officers of the Association, speakers and distinguished guests are seated at the extreme right.



G. A. Austin, Consolidated Quarries Corporation, newly elected N.C.S.A. president.

J. R. Boyd, Administrative Director of N.C.S.A.

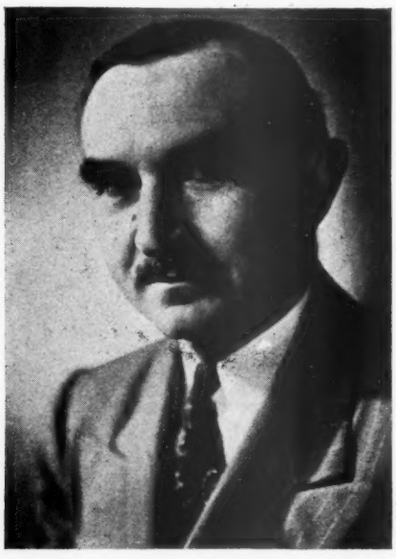
S. P. Moore, Concrete Materials & Construction Co., Chairman, Agr. Lst. Div.

Henry A. Huschke, Managing Director, Agricultural Limestone Division.

L. M. Walling, United States Dept. of Labor, New York, N. Y.

Daniel Harrington, Chief, Health and Safety Branch, U. S. Bureau of Mines.

H. E. Foreman, Managing Director, Associated General Contractors.



United States Senator Wayne L. Morse of Oregon.

John C. Gall, Attorney at Law, Washington, D. C.

THE LIME PLANT OPERATOR

BY WOLF G. BAUER

THE TRAVEL OF STONE AND LIME THROUGH KILNS

Wolf G. Bauer

IN treating this topic, the rotary kiln must again be completely divorced from the vertical kiln, as the action of the material bed and individual pieces of lime and stone are fundamentally different in these two types of calciners. However ore travel through pre-heaters and coolers of the direct contact convection type can best be grouped with vertical kilns.

Rotary Kiln Bed Action Two conditions predominate — the continuous rolling and cascading action of the top layers of the bed as found in most kilns, or the periodic surging en-masse phenomenon in which all or most of the bed is carried up against the lining until the whole bed slides and shears off. The cyclic action of this surge condition is shown in Figure 1 in successive stages a, b, c and a_1. Figure 2 illustrates the conditions of continuous bed movement. The changes in degree of rolling and mixing with changes in speed of rotation are easily visualized, i.e. the angle of shear is steepened, the rolling and sliding of particles in the top layers is faster and from a higher point of origin, the bed surface is more concave, exposure time of top layer particles to radiation and convection is shorter and more frequent, the moving layer becomes deeper, segregation is less pronounced, and the bed is more uniformly heated.

Surge Condition Under this action the bed appears to behave as a unit mass which simply is carried up the side of the kiln for a short rotational period and then seems to slide down the lining to a new position in which it rests momentarily at a flatter angle of repose than the one from which it started its slide. Under certain conditions of lining roughness, particle size range, and kiln speed this sliding may take place either along a shearing plane within the bed, in which case some limited mixing may take place, or the bed will actually slip off the lining without much internal movement. (In certain rotary coolers this takes place due to lack of shell friction.) Such a condition should naturally be avoided by all means. Decreasing the bed packing or choking tendencies by screening out predominant void-filling fractions, changes in lining smoothness by brick projections, decreasing the depth of bed and increasing of kiln speed all help to overcome this condition in some measure.

Continuous Roll Condition Here the continuous cascading and rolling of top layers over the lower bed portion exists as the more prevalent condition in rotary kilns. Due to closer sizing, the elimination of a middling fraction by blending a top and undersize in certain proportion, or because of certain bed depth or lining condition, or speed of kiln rotation, more or less concentric layers of lime or stone particles roll, slide, or sift in a definite continuous pattern. Scale model action tests by the writer, in which particle movement could be studied behind glass panels, more or less substantiated the particle size arrangement found in fully loaded kilns after they had been cooled sufficiently to investigate bed-cross-section conditions.

If we took an instantaneous action picture of particles of lime or stone under influence of the slow rotating movement of a rotary kiln, we would be able to differentiate between two types of particle movement and movement direction, as viewed in vertical cross section, and at right angles to the kiln axis. The most obvious movement is the rolling or cascading action of the top layer or layers near the surface. Just how deep this moving layer is depends on the kiln speed, lining roughness, bed

FIG. 1
EXAGGERATED SURGE CONDITION

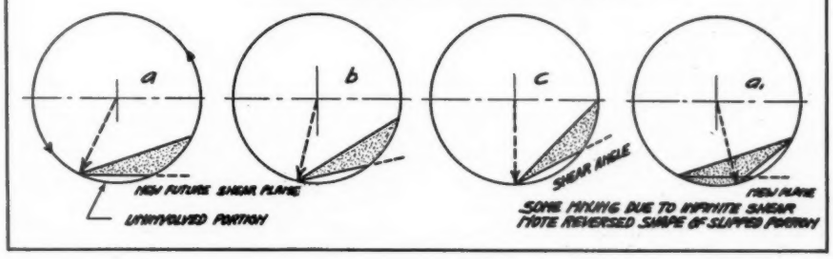
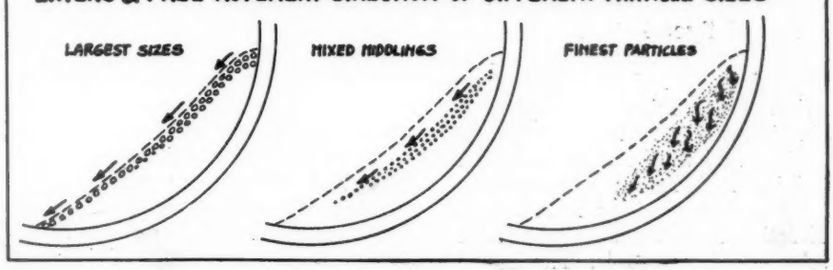


FIG. 2
CONTINUOUS ROLLING CONDITION
LAYERS & FREE-MOVEMENT DIRECTION OF DIFFERENT PARTICLE SIZES



depth in relation to kiln diameter and particle size range, but it usually involves the movement of the larger pieces. This is analogous to the cone piling of different size particles in which the largest roll the farthest and collect on the bottom and outside periphery of the conical pile. The second movement is more obscured and less apparent as it takes place within the bed. Direction of free movement is shown by the arrows in Figure 2. This is a sifting and filtering movement at a steeper angle than the top layer particles take, and is confined to the smaller sizes which can work their way through the spaces between the larger. This action is considerably enhanced in a rotary kiln by the loose condition of the bed, and the vibrations and tremors of the kiln.

When stone grading is such that the void spaces among the larger fractions are completely filled with fine material, packing is pronounced and rolling freedom is restricted. When fines are present in even larger amounts, i.e. if they have spread apart the larger particles past their normal contact positions, then they will act as a lubricant, and sliding with little rolling occurs. In that position the bed may surge periodically, and the top layer may shear off practically at the lining.

In all this we have considered only the largest and the finest particles. The middling sizes also move to some extent, inasmuch as some are dragged along at the shearing plane of the top moving layer. However for the most part they form the central portion between the surface rolling layer and the stationary bottom layer against the lining. These middlings obtain the least heat, as they are shielded and choked up with fines, and seldom come in contact with radiant or convection heat from the gases or the lining. This would indicate that the rotary kiln, rather than acting as a good mixer, is actually segregating particles according to sizes and fraction amounts under certain conditions. This condition is generally aggravated when the bed is deep.

Particle Size and Forward Speed Contrary to popular belief, there is no free forward movement of particles toward the kiln discharge point. The longitudinal slope of the kiln is insufficient for such forward sliding, and the bed has insufficient fluidity and height differential to form a flow gradient in a forward direction as in the case of a loaded tube mill, for example. The forward movement is actually accomplished while the particle is at rest in the static lifting period within each bottom layer of concentric circulation. The fall, roll, or slide from the elevated position is in a vertical plane.

Now if all particles which are under free rolling or slipping movement had the same lineal velocity at the same slope angle, then it would be apparent that those having a shorter path of descent would simply be lifted up and forward again more frequently. They would arrive at the discharge end at the same time as those of a longer free movement path, since their ratio of elapsed time of lifting to rolling would be the same. However it seems more logical to suppose from the foregone discussions of particle size segregation that this is not the case, and that certain sizes of particles move down over and through the bed at varying speeds due to various degrees of freedom and interference, and that therefore the time ratio between lifting and falling varies; changing the relative time for forward lifting, and so the rate of travel through the kiln. The rate of forward travel depends, however, not only on the relative length of time a particle is lifted up and forward, but also on its position in the bed, relative to both the distance from the center axis of the kiln as well as the height vertically. A particle being lifted up and forward in an arc closer to the kiln center will be placed less far forward than one that rides up against the lining in the same rotational kiln movement or time interval. A particle describing lifting and rolling circling paths in a high position in the bed will have a larger forward component on lifting than one in a lower or larger circulation area for the reason that the forward component of a point on an inclined cylinder is greatest at the vertical midpoint, and least at the top and bottom for any equal rotational degree. A study along these lines under actual kiln conditions might prove of value in determining the importance of particle sizing with respect to forward travel time, and one which should also be correlated with heat exposure in the bed action at right angles to forward travel.

Sizing of Value From this brief picture it becomes apparent that rotary kiln operators should look more closely into possibilities of scientific proportioning and blending of various stone fractions for the achievement of the most uniform calcination conditions and output rates. This is often a juggling of relative economies in handling certain screen sizes in kiln feed bins as against improvements in burning conditions. However where in some plants kilns are required to burn two or three different sizes successively each day, some operators have found that certain sizes could be mixed in definite proportions and burned successfully. Much depends on the degree of pulverization by attrition of any particular lime and stone. In any case, here is a much neglected field of investigation.

Bed and Particle Movement in Vertical Kilns

Packed beds, columns or masses of broken solids disposed within confining walls are subject to gravitational and frictional forces in shaft kilns, blast furnaces, vertical stone preheaters and lime coolers, gas producers, etc., as well as bins, bunkers, reaction towers and the like. The vertical shaft kiln may therefore be considered a more or less simple bin, and most material movement phenomena applying to bins also apply here.[1] However, there are further factors and variables that enter the picture, and it is these with which we will be mainly concerned.

Static Conditions Although vertical kiln operation is undergoing a gradual change from a periodic fall and hang method to a continuous or semi-continuous flow technique of moving lime and stone through the calciner, most kilns at this time are still made to arch and hang, and are drawn at certain time intervals. Sticking or hanging the charge in the kiln is a necessary evil, at best. It is probably an admission in itself that heat distribution as well as relative lime down-travel is not under complete control, and that any shortcomings must be corrected by working hot spots or slow sections down into the cooler by punching. The kiln charge arches or hangs because of wall friction and internal mass friction. Friction forces are very great due to point contacting of angular particles. Arching occurs readily because of the relatively small ratio between kiln and particle cross-section, and constricting lining designs. Some vertical kilns, like mixed-feed kilns or certain specially designed kilns are not allowed to hang, but in those cases some downward travel control is sacrificed, even with multi-draw gates. However with the trend toward greater

[1]See also Bauer, W. G.: "Factors Affecting the Movement of Materials through Bins, Gates and Feeders," August, 1945, issue of PIT & QUARRY.

use of smaller stone sizes, and the experience gained with vertical stone pre-heaters, lime coolers, and calciners like the Ellernan kiln, down-travel control of the charge becomes increasingly easier and more positive.

Aside from arching due to lateral pressure against the kiln lining, and the interlocking action of the particles themselves, we have two other contributing conditions — stickiness or adhesion due to fusion of impurities on the lime and refractory surfaces, and thermal expansion due to heat increase in the heating-up interval between draws. Singly or together, these factors may momentarily prevent the charge from slipping down or filling the void created by lime withdrawal in the cooler. It is understood, of course, that all this is modified and often controlled by the kiln and burner design which introduces projections or restrictions in certain zones, and which promotes looseness or tightness of the ore at various points.

Flow Conditions Whenever a mass of broken solids moves by gravity it can be likened to a viscous liquid like tar or syrup. Such liquids convincingly illustrate the effects of wall or drag friction. One can actually see laminar shearing planes when such a liquid moves down a channel, each infinite successive layer toward the center of the stream moving faster than the preceding one. These unequal shearing or friction forces are equally at play in the kiln, and their lines move out or recede around any and all projections or indentations in the lining contour.

In a mixed feed kiln where the cross sectional area increases downwardly to the cooler, the relative displacement flow lines are quite straight across the kiln section as compared to equivalent lines drawn to illustrate flow in the more common vertical shaft kilns in which the walls are either vertical, or converge downwardly in the hot zone. This latter lining constriction is a functional design, an outcome of a desire to penetrate more easily to the center of the kiln with gases and heat, and to facilitate hanging for the purpose of trimming the hung-up charge. In all cases, the design of cooler and discharge devices and arrangements must be closely tied up with the internal design of the kiln in order to overcome uncontrolled and uneven downward movement of the lime.

Flow Equalizers In most vertical kilns, as indeed in any container in which material moves subject to gravity under the influence of wall friction, the flow is speediest in the stream center, slowest along the walls. To overcome this natural tendency, designers have introduced obstructions in the path of the faster center portion with varying success. It is necessary to realize that an even downflow in the calcining zone is much more important than in the pre-heating or cooling sections, although an even and controlled flow is preferable in all. Scale model flow tests which can be studied behind glass partitions are helpful in determining the possible extent or sphere of influence of internal kiln lining and accessory forms on the various sections of the charge.

Flow equalizers have been built in the form of single refractory piers, bridges or saddles, sometimes arranged in spoke form across the kiln, and located generally at the bottom of the combustion zone or at the gas inlet eyes or ports level. Refractory or metal columns projecting from the base through the cooler have also been employed, especially in mixed-feed kilns, in which instances the lime discharge is around the periphery of the base column. For various types of such arrangements used in Europe, the interested reader is referred to Searle's book "Limestone and Its Products". All such flow equalizers form hindrances and tend, therefore, to make the charge more susceptible to arching and hanging, which in certain operational techniques is, of course, the object. They also decrease the active or live space in the kiln. If they are used to equalize continuous flow, then they should take other forms than crosspiers or bridges, since they are not symmetrical to the kiln cross-section, and therefore cannot produce equalized flow in all directions.

One of the great disadvantages of equalizing material flow through the use of obstructions is the strong tendency for fine stone and lime to fill and pack the void spaces between the particles directly above these obstructions. If such packed sections are left undisturbed, they will grow, become denser and more consolidated, and finally form a core or "dead man" in the kiln. Such tight spots become rapidly heated to much higher - than - surrounding temperatures, and tend to produce hot gas channels along their sides. This can only be prevented by changes in design, i.e. limiting the width or length of the projecting surfaces, using very steep highly refractory top caps and surfaces on which lime does not rest easily, and keeping the surrounding lime mass in a loose condition by increasing the active kiln cross section at the danger levels. When we discuss gas flow and burners in a later issue, we will have more to say about these effects. Solution to these difficulties will probably not rest in obstructions but in strategically placed discharge openings. The increasing utilization and desire to use smaller sizes of stone for vertical kiln burning will tend to make this problem less difficult, even though it increases gas distribution problems.

New York Limestone Survey Made from Airplane

An airplane was used recently to aid members of the New York State Science Service in mapping the limestone belt near Fort Ann in Washington County. Officials said that the soil and rock formations could be easily observed from the air and that, in one case, the use of the plane had made possible the securing of needed information in half an hour, which might have required several weeks of work on the ground.

R.F.C. Assistance Available For Public Buildings

Projects now eligible for Reconstruction Finance Corporation aid include the construction of hospitals, public buildings, school and college buildings, dormitories, stadiums, dock and harbor facilities, as well as municipal utilities installations. Borrowers may be cities, towns, villages, counties, etc.; and the R.F.C. will consider financing to a maximum of 100 per cent. of the cost.

S. Dakota Cement Plant Makes $128,525 Profit

South Dakota's state-owned and operated cement plant made a net profit of $128,525 in 1945, according to an announcement by Governor M. Q. Sharpe. Sales totaled 217,868 barrels, compared with 167,000 barrels the year before. In 1937 the plant sold 324,236 barrels; in 1941, 235,420; and in 1942, 432,095.

$45,000 Loss Estimated in Lux Sand & Gravel Fire

A fire which swept the buildings of the Lux Sand & Gravel Co. of North Bend, Nebr., resulted in a loss of about $45,000 to the firm. The blaze, which originated in the office and garage, spread throughout the plant, causing a total loss of buildings and contents, including the company's fleet of trucks and tractors.

A new rock wool operation was launched recently by the Northern Rock Wool Co. at St. Paul. One cupola is in production, and a second is being installed.

Officers of the firm are Ira Nelson, president; V. Nelson, vice-president; C. V. McKinney, secretary-treasurer and plant manager.

PERSONAL MENTION

J. R. Spencer

JOHN R. SPENCER, director of the Soil Improvement Department of the Illinois Agricultural Association since 1937, has resigned to accept a position as sales manager of the Donald F. Butler Company, Franklin Grove, Ill. This concern operates portable limestone equipment in six different locations.

During Mr. Spencer's nine years with the Illinois Agricultural Association, the application of limestone and rock phosphate on Illinois farm soils has increased each year to the largest amount ever used by any state in the nation. In the last few years approximately 4,000,000 tons of limestone and from 200,000 to 300,000 tons of rock phosphate have been applied annually.

Mr. Spencer's work for the association was concerned with quality supervision of agricultural limestone produced by the 150 quarries serving Illinois farmers and similar work on rock phosphate shipments. He is at present on Governor Green's committee on development of the state's natural resources.

A. J. Cayia

A. J. CAYIA, who has been associated with the Inland Lime & Stone Co. of Manistique, Mich., since 1928, has been appointed vice-president and general manager of the company according to an announcement by Clarence B. Randall, president.

Mr. Cayia will have charge of all phases of the firm's operations. His headquarters will be in Manistique.

DR. BERNARD LEWIS, an authority on explosives, propellants and combustion, whose wartime research activities won him the Legion of Merit, was promoted to the rank of chief of the Explosives Division of the Bureau of Mines. In his new position, a post which has been vacant for some time, Dr. Lewis will supervise projects fostering the safe manufacture and handling of explosives.

Dr. Lewis entered the Bureau of Mines in 1929 as a physical chemist at Pittsburgh, Pa., where he will be stationed at the Bureau's Central Experiment Station.

G. WEBBER KNIGHT has been appointed manager of the Washington, D. C., office of the Pennsylvania Salt Manufacturing Company.

Mr. Knight will look after all company interests in Washington and will act as a clearing house in all Pennsalt matters involving both domestic and foreign government agencies. He has been with the company for 21 years in managerial positions.

Their many friends will be interested to know that GEORGE D. LOTT, JR., and HAMILTON LOTT are back at their posts at the Palmetto Quarries Co., Columbia,

G. D. Lott, Jr.

Hamilton Lott

S. C., after over four years of service in the United States Army. Both rose to the rank of Captain in the Coast Artillery. George D. Lott, Jr., vice-president of Palmetto, spent seven months in the Pacific theater in Korea, the Philippines, and so on. Hamilton Lott, chief engineer, spent 31 months in Africa and Italy. Both are graduates of The Citadel, Charleston, S. C., George, Jr., in the class of 1937 and Hamilton in 1939. George D. Lott, Sr., is president of the company.

EDWARD MEAGHER of the Texas Gulf Sulphur Co. was named chairman of the New York Section of the American Institute of Mining and Metallurgical Engineers, Inc. Others who will serve as officers for 1946 are FRED B. ELY and THOMAS G. MOORE, vice-chairman; O. B. J. FRASER, treasurer; M. L. HAIDER, and JOSEPH H. REID, committeemen.

A. I. JOHNSON of Keystone, S. Dak., was made chairman of the Black Hills section of the American Institute of Mining and Metallurgical Engineers, Inc., as a result of an election held in January. Other officers chosen were as follows:

E. L. TULLIS, vice-chairman; C. N. KRAVIG, second vice-chairman; J. O. HARDER, secretary-treasurer; R. S. HILL, C. J. BENDER, W. C. CAMPBELL and H. A. WALKER, members of the executive committee.

E. J. MAUST has been engaged by the Coronet Phosphate Co. at Plant City, Fla., as director of research.

JOSEPH B. GILLENWATER, recently of the U. S. Army, has accepted a position as mining engineer with the United States Gypsum Co. at Southard, Okla.

RICHARD W. SMITH, who formerly served as district engineer with the U. S. Bureau of Mines at Tuscaloosa, Ala., was made assistant manager of the Natural Resources Department, United States Chamber of Commerce, Washington, D. C. During World War II Mr. Smith was district engineer in charge of the Bureau's prospecting for war minerals in Alabama and Mississippi.

JOHN G. BARAGWANATH has been appointed director of exploration by the Freeport Sulphur Co. of New York, to be in charge of a large-scale program for locating and developing mineral deposits throughout the world. Mr. Baragwanath has been active in mining projects in Peru, Ecuador, Canada, Cuba and the United States.

KARL V. LINDELL has joined the Canadian Johns-Manville Co. of Asbestos, Quebec, as underground mine superintendent. The company recently began production at its new underground operation site. Mr. Lindell was for 17 years associated with the International Nickel Co. of Canada.

George R. Christie

GEORGE R. CHRISTIE was elected president and chairman of the Asphalt Institute's executive committee at the annual meeting of that organization. Mr. Christie is affiliated with the Socony-Vacuum Oil Co.

Other officers appointed are: B. E. Gray, re-elected general manager and chief engineer; Herbert Spencer, secretary; F. V. Widger, treasurer.

GAIL A. HATHAWAY, of the office of Chief of Engineers, U. S. War Department, has been chosen vice-president of the American Society of Civil Engineers, oldest national engineering organization in the United States, succeeding A. C. Polk of Birmingham, Ala., who died in office recently.

Mr. Hathaway was associated with the U. S. Engineer Department in Kansas City from 1928 to 1937. His work there included the hydraulic design of Fort Peck Dam. An active member of the American Society of Civil Engineers since his election as a member in 1934, he was president of the Society's District of Columbia section in 1942.

ED TILLOTTSON, HENRY MANIA, FRED ZIPP, JOHN HEGENER, GLEN VAN DUSEN and LYLE ERNST, all employees of the Petoskey Portland Cement Co. of Petoskey, Mich., were awarded 25-year-service certificates by GEORGE W. JOHN, vice-president and general manager of the company, at a safety meeting on February 22.

ANDREW BOGREN and FRANK RADLOFF, who were unable to be present, also were eligible for the awards. Mr. Bogren began his service in 1905 with the Elk Cement Lime Co., the firm which later became the Petoskey Portland Cement Co.

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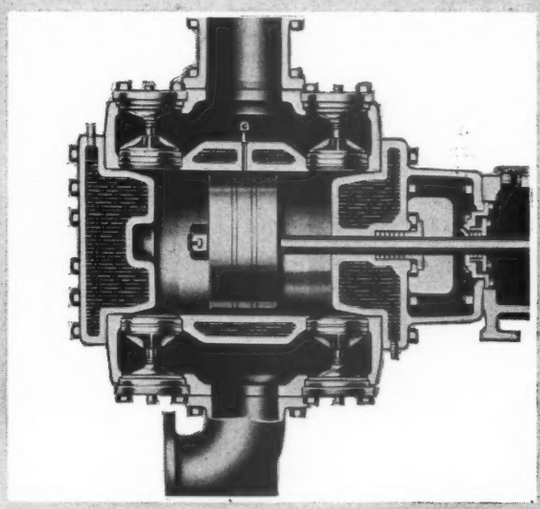

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3. **Low volatility to reduce carry-over to air line.**
4. **Rust-preventive properties to protect cylinder walls and rings.**

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Fluidity at low temperature is necessary to protect cylinder parts both in starting and before operating temperatures are reached . . . only a well-balanced blend such as Shell Compressa Oil gives cylinder walls protection under all conditions.

Volatility has a lot to do with cylinder oil consumption. Both in the choice of crudes and in refining, those components affording low volatility are selected for Shell Compressa Oils. Result: safe lubrication with minimum feed.

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SHELL COMPRESSA OILS

SHELL

RICHARD SIMONS, sales manager of the Weston & Brooker Co., Columbia, S. C., recently returned to this position after 3½ years of service in the armed forces. He rose to the rank of Commander in the Naval Aviation Reserve and as a flight officer saw service in the Aleutians. He also served as a flight instructor in this country.

W. W. Kinginger

W. W. KINGINGER, who was formerly vice-president and superintendent of the Diamond Portland Cement Co. of Middle Branch, O., retired from his duties on December 31, 1945. He continues to serve the company as a member of its board of directors.

Mr. Kinginger became a member of the Nazareth Portland Cement Company staff at Nazareth, Pa., in 1900, after which he was affiliated with numerous cement plants in the United States, Canada and the British Isles. Upon his return from England he accepted a position with Diamond as chief chemist. He has been superintendent since 1931 and vice-president since 1937.

W. B. Rodgers

W. B. RODGERS, vice-president of the McCrady - Rodgers Co. of Pittsburgh, a flood control advocate and a former U. S. Senator, has been named to serve as one of five members of the newly-created Allegheny County Sanitary Authority. The new board will direct an $80,000,000 sewage improvement project for Pittsburgh, as required by a new state law.

EUGENE HOLLAND, who was president and general manager of the Universal Gypsum Co. from 1928 to 1936, was recently elected president and director of the Masonite Corporation. He succeeds M. P. MCCULLOUGH, one of the founders of the Masonite Corporation, who is retiring.

L. C. CURTIS, vice-president of the Lyman-Richey Sand & Gravel Corporation of Omaha, Neb., has been elected president of the Nebraska chapter of the Associated General Contractors of America. He replaces W. A. BIBA.

MR. AND MRS. SIMEON MCCLAIN of Point Marion, Pa., observed their 62nd wedding anniversary on February 8. Mr. McClain, one of the founders of the McClain Sand Co. of Port Marion, is 88; his bride is 85.

J. W. SHAW recently became vice-president and sales manager of the Limestone Products Company of Menominee, Mich. Mr. Shaw succeeds LEONARD J. JOHNSON, who resigned.

C. S. ANDRES, has been appointed plants manager by the Wolverine Portland Cement Co. of Kalamazoo, Mich., for both the Quincy and the Coldwater plants. Mr. Andres replaces L. B. GRAY, who resigned to accept a position with a machinery export firm.

C. S. Andres

While he was affiliated with the Lone Star Cement Corporation, Mr. Andres served in at plants in Houston, Tex., Hudson, N. Y., and at Cayo Mason, Cuba.

NORMAN J. HUBER, manager of the Gravel Products Corporation of Buffalo, N. Y., was appointed chairman of the Industrial Division for the 1946 Red Cross campaign in Buffalo.

OBITUARY

Gordon Hughes

GORDON HUGHES, 50, sales manager and a director of the Inland Lime & Stone Co. of Manistique, Mich., died on February 7 in an Edinburgh, Tex., hospital of injuries resulting from a motor accident near McAllen, Tex.

Mr. Hughes, who had been associated with the White Marble Lime & Stone Co. since 1924 and subsequently with the Inland company, which absorbed White Marble in 1928, had served as a director of the National Lime Association. He was also sales manager for the Hillside Fluor - Spar Mines at Rosiclare, Ill.

JOHN A. BLANK, consulting engineer for two Mexican firms—Cementos Atoyac, S. A., Puebla, Puebla, and Cementos Veracruz, S. A., Orizaba, Veracruz—was killed in an automobile collision near Henderson, N. C., on March 10. Mr. Blank, accompanied by Mrs. Blank, had been visiting cement plants in the United States and was on his way to his home in Ironton, O.

After serving for a time with the Phoenix Cement Co. of Nazareth, Pa., and later with the Lehigh Portland Cement Co. at New Castle, Pa., Mr. Blank was made superintendent of Lehigh's plant at Ironton. In recent years, while affiliated with the Mexican plants, he supervised the erection of the cement plant at Orizaba. His son, ALTON J. BLANK, is general manager of this plant.

EDWARD SEALS, 33, an employee of the Mt. Carmel Sand & Gravel Co. of Mt. Carmel, Ill., was drowned on February 20 in the Wabash River. He was thrown overboard when a motorboat he had been operating near one of the company's dredges capsized at the mouth of the White River. So strong was the current of the swollen Wabash that the search for the body had to be abandoned as too hazardous.

JOHN H. SOWERBUTT, 49, secretary-treasurer and a partner of the firm of Sowerbutt Quarries of Haledon, N. J., died of a heart attack at his home on February 25. Mr. Sowerbutt had been associated with his brother, Richard, in the quarry business for the last 25 years.

HENRY MCSWEENEY, 91, president of the United States Potash Co., died at his home in Atlantic City, N. J., on March 5. Mr. McSweeney had headed the firm since its organization in 1925.

CHRISTOPHER STEADMAN, 72, a civil engineer who for many years had been manager of the American Brick Co., died on February 24 in a Staten Island, N. Y., hospital.

While affiliated with the Massachusetts Broken Stone Co., of Boston, Mr. Steadman built the first official highway in the United States and completed the first cement and concrete work on bridges and abutments for Massachusetts and New Hampshire.

FRANCIS D. MCMILLIN, 43, a district representative of the Diamond Portland Cement Co., of Canton, O., died on February 9 in Pittsburgh.

LEWIS H. ROTHRAUFF, 60, who operated the Spring Sand & Stone Company, Reading, Pa., since 1921, died at a hospital in that city on February 5 after an illness of several weeks.

CHARLES NEAL, 47, who owned and operated the Neal Sand & Gravel Pit at Utica, Ind., died after a heart attack on February 8 at Watson, Ind. Mr. Neal had operated the plant for the last two years.

RUSSELL E. KOONTZ, 43, superintendent of the Empire Stone Co., Bloomington, Ind., was found dead in a concrete pit at an abandoned stone mill near the city on March 1.

ARTHUR R. HALEY, manager of the Pittsburgh Plate Glass Company's Columbia Cement Division plant at Zanesville, O., died of a heart attack on February 14 at his home in that city. He had been associated with the Columbia Cement Division for the last five years.

DAVID ADAM, 63, former safety engineer for the Lawrence Portland Cement Co., Northampton, Pa., died on February 26 in an Allentown, Pa., hospital after a brief illness. Mr. Adam supervised the safety program of the Lawrence Portland Cement Co. for 21 years. He was actively interested in the work of the National Safety Council and appeared as Uncle Dave on radio programs formerly sponsored by a local council.

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Legal Decisions

By LEO T. PARKER

A few days ago I received a letter as follows:

"I wrote a letter and in it I agreed to purchase merchandise for our corporation. However, I did not sign the letter, but only signed my initials. Can this seller hold us to the contract?"

The answer to this question is positive. Yes, your corporation is liable on this contract. Furthermore, the corporation would be liable although the official's signature had been typewritten, or rubber-stamped, or printed, provided that the official had authority to make contracts of this nature.

Contrary to the opinion of the majority of persons, any form of an *authorized* employee's signature, such as that made with a rubber-stamp, typewriter, symbols, initials, and the like *may be* valid and enforceable.

See *Meyers,* 53 S. E. 447. In this case the higher court, when deciding the right of an employee to bind his employer by indorsing the latter's name with a rubber-stamp, said:

"Where the name required has been so placed by one having authority to do it and *with intent to indorse* the instrument, . . . this is a valid indorsement."

Gravel Is Not Mineral

According to a late higher court decision, the reservation of "mineral royalty" in a conveyance or deed does not include sand or gravel on the property, although it is susceptible of commercial production and use.

For illustration, in *Beck v. Harvey,* 164 Pac. (2d) 399, reported February, 1946, it was shown that the owner of land sold it but in the deed was a clause reserving to the seller the "mineral royalty on said premises."

Later the legal question arose whether a contract was valid by the terms of which the seller granted the right to a company to remove sand and gravel from the premises. In other words, the court was asked to decide whether "mineral" rights include sand and gravel. The higher court held in the negative, saying:

"Sand and gravel is not mineral within the terms of conveyances, grants and leases. . . . While commercial gravel belongs to the mineral kingdom and is similar by nature, it is not regarded as a mineral."

Also, see *Waring v. Foden,* 1 Ch. 276, 86 A. L. R. 969, where the higher court held that gravel is not a mineral.

And, again in *Praeletorian Diamond Oil Ass'n v. Garvey,* Tex. Civ. App., 15 S. W. (2d) 698, the higher court held that the right to take gravel would not follow the conveyance by lease of all the oil, gas and other minerals in and under the real property or land.

Must Prove Royalties

It is well established law that a property owner who sues for royalties due for sand and gravel removed from his land must positively prove the amount due, otherwise the court will not render a verdict in his favor.

For example, in *Walker v. Fitzgerald,* 24 So. (2d) 263, reported February, 1946, it was shown that a property owner leased certain land to a company for the purpose of mining for and removing sand and gravel. The property owner sued the company to recover money for royalty allegedly due for the sand mined and removed from the land. However, the property owner failed to positively state the amount due. The higher court refused to render a verdict, saying:

"The value of the sand and gravel, when ready for market, is not shown. It likely varies. Surely such values run into scores of thousands of dollars. The measure of his rights, which embraces the validity of the attacked contracts, must be considered in determining the amount in controversy, as well as the value of rights asserted by plaintiffs."

Public vs Private Nuisance

The legal distinction between a public and private nuisance lies merely in the extent of injury or annoyance. If injury results only to a few, the nuisance is private, but if the injury is sufficient to become common to *all* persons who may come within its influence, it is a public nuisance.

For example, in *State v. Parsons Company,* 155 Pac. (2d) 458, it was shown that certain property owners filed suit and asked the court to declare a business a "public nuisance" because many motor trucks stopped and started in front of its business.

In refusing to grant an injunction or stop operation of the business, the higher court said:

"The business itself was legitimate. The cars of which witnesses spoke were there on lawful business. The mere fact that a business attracts a great many customers to it who come in cars does not constitute the business a public nuisance."

Also, various witnesses testified that the operation of the plant creates noise. Some of the noise from the plant is continuous while the plant is in operation, both by day and by night. One noise is the humming sound made by motors. There is also some noise from the operation of the other machinery.

The court refused to grant any protection to adjacent property owners during the day time, and said:

"The noises when made during the daylight hours produce no more disturbance than the noise customarily incident to urban life, particularly in proximity to busy traffic ways such as Main Street is in the locality in question. Under such circumstances said noises do not amount to a public nuisance."

On the other hand, the court granted an injunction against unusual noises between 10:30 p. m. and 6 a. m., saying:

"When made during the hours customarily devoted to rest, the noises are by reason of their irregularity, suddenness, volume and intensity, annoying and prevent such residents from securing proper rest and sleep. Such noises from said plant between the hours of 10:30 p. m. and 6 a. m. constitute a public nuisance."

Priority Breach

A late higher court has held that a property owner is liable for breach of a contract caused by insufficiency of priority rating to obtain materials to complete a building repair contract.

For example, in *Detroit Independent Sprinkler Company,* 18 N. W. (2d) 387, it was shown that a property owner entered into a contract with a contractor to repair a building.

The contractor was unable to obtain a priority rating high enough to fulfill the contract. The property owner assumed that the contractor had abandoned the job, and had the repair work installed by another contractor.

The first contractor sued the property owner for heavy damages and based his suit upon breach of the contract.

The higher court decided that it was the duty of the property owner to obtain the high priority rating and his failure to do so was a legal breach of the contract. The court held the building owner liable in $12,000 damages, saying:

"It is enough to say that defendant (property owner) assumed the responsibility of securing the priority rating and cannot now complain as to its insufficiency."

Thus, owners who are confronted with suits of this nature will do well to compromise the controversy rather than proceed through expensive litigation and finally be held liable for full damages sustained by the contractor who was unable to supply materials due to insufficient priority rating.

If similar situations arise in future, all contractors should be certain to include in all contracts involving priority of materials a clause in effect that the owner will be liable for breach of the contract in event the contractor is unable to perform work due to the owner's inability to secure the high priority rating necessary for the contractor to complete the contract.

Supplies Laws Differ

According to a late higher court decision, a general contractor never is liable for payment of materials purchased by a sub-contractor, unless the testimony proves that the latter acted as agent of the general contractor.

For example, in *Grinnell Company, Inc., v. Miller,* 150 Fed. (2d) 345, reported November, 1945, a company brought suit against a general contractor for a balance due on an account for certain materials ordered from the company by the sub-contractor, and furnished to a job of the general contractor. In holding the general contractor not liable, the higher court said:

"With regard to plaintiff's (company's) contention that Hurowitz (subcontractor) was the agent of the Miller

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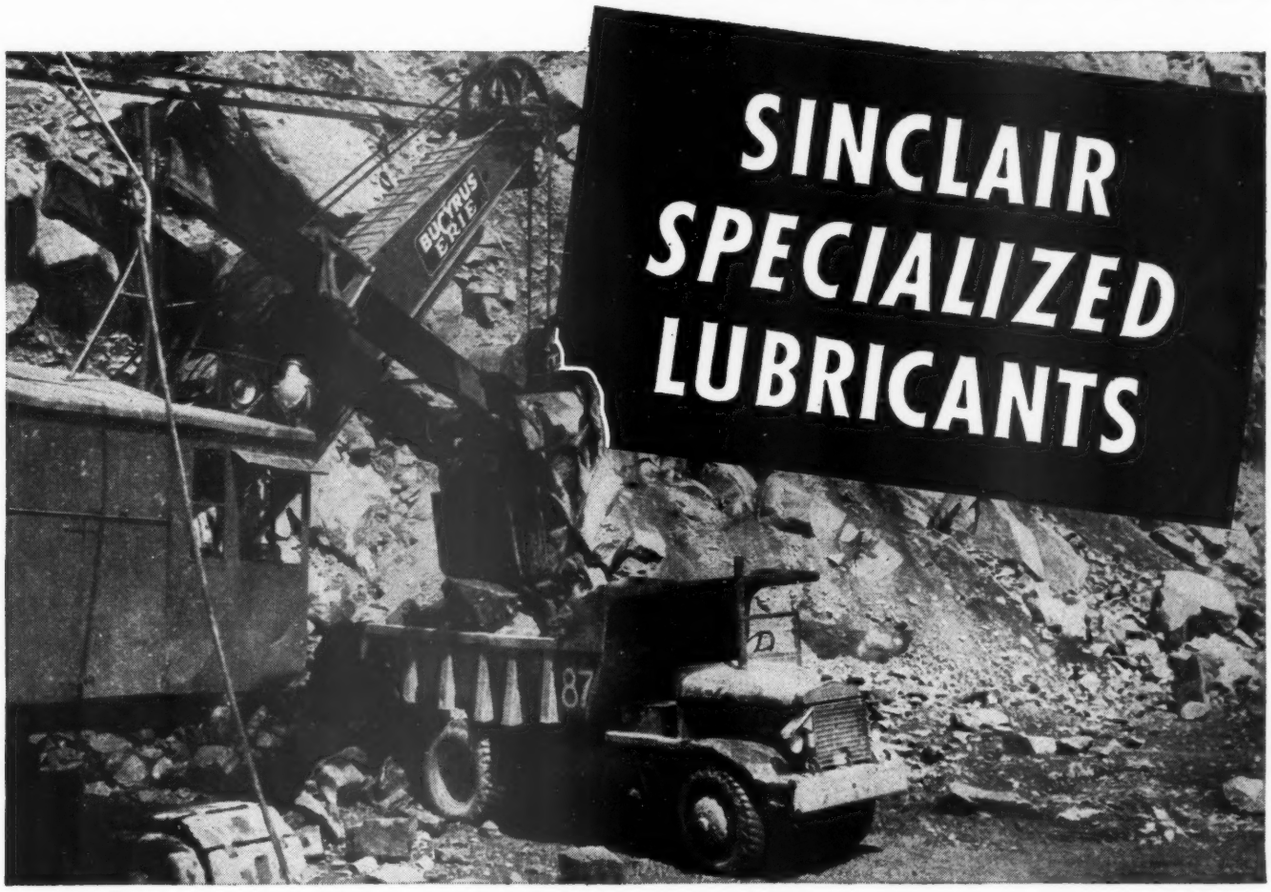

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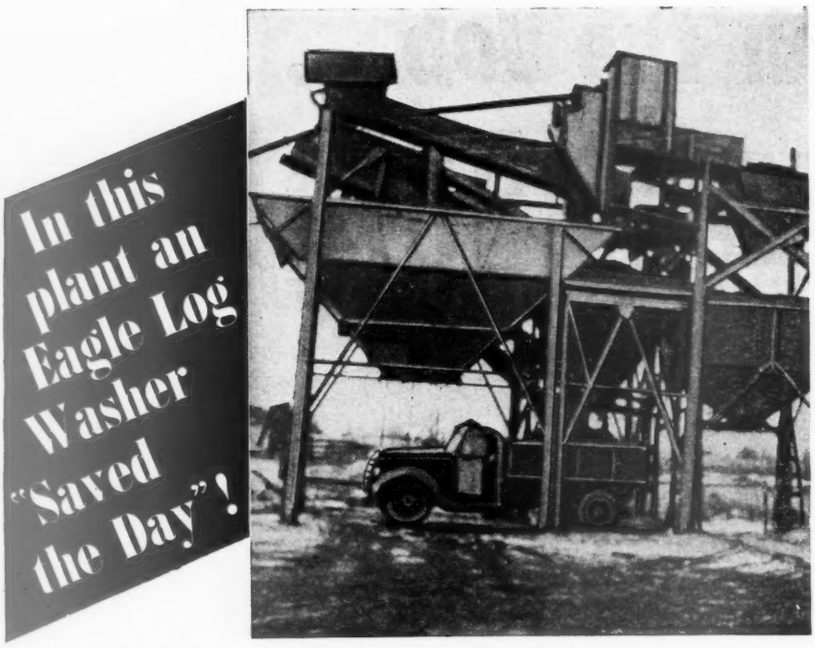

In the semi-portable plant of a northern operator* pictured above, an Eagle Log Washer solved a clay removal problem which had been seriously detrimental to profitable operation.

In many sand and gravel plants, washing conditions are encountered where the conventional screw washer will not give the cleansing required because of an inadequate breaking down of cemented aggregate, tough clay or conglomerates and certain types of soft stone. The Eagle Log (or paddle type) Washer has proved successful in breaking down and removing these difficult clays and cemented aggregates.

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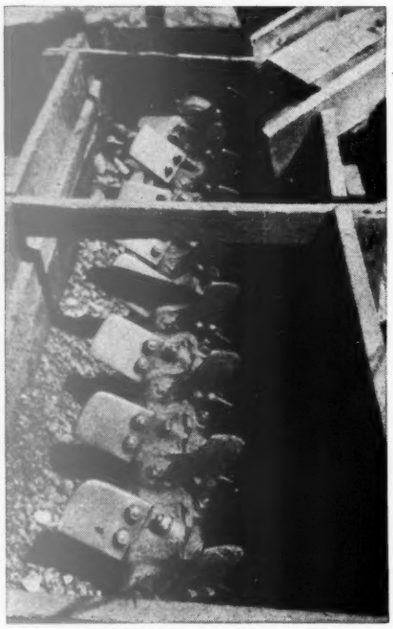

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Company (general contractor), there is no evidence whatever to substantiate such claim."

Thus, if a seller of supplies *fails* to prove that materials furnished a subcontractor were "ordered" by the general contractor, the seller can recover payment *only* from the sub-contractor, and the general contractor and his surety is not liable.

Must Solve Negligence

All persons who sue for damages for injuries on the ground of negligence are required to prove their case by a *preponderance* of the evidence. Otherwise the injured person cannot recover damages.

For example, in *Prochaska v. De Costa,* 63 N. E. (2d) 794, reported January, 1946, it was shown that children playing on a trash pile were seriously injured when dynamite caps exploded. The parents sued a company alleging that carelessness of its employees in placing the explosives in the trash pile resulted in the injury. The higher court refused to hold the company liable, saying that the evidence failed to prove that the company's employees had placed any explosive materials on the pile of debris on the vacant lot.

Attractive Nuisance

Where the owner of property maintains on his premises something which, on account of its nature and surroundings is especially attractive to children, then the jury may defer that the property owner is liable.

The doctrine of attractive nuisance is based upon the theory that children may come upon private premises in response to the "attraction" of a dangerous object placed thereon by the owner. But without an unusual attraction a property owner is not liable for injuries to children who are trespassers.

See *Ohler v. Trinity Portland Cement Company,* 181 S. W. (2d) 120, where it was shown that a cement company erected a barbed wire fence consisting of twenty-two strings or strands. However, a boy named Hall climbed over the fence and was electrocuted. His parents sued the cement company for damages. In holding the company not liable, the higher court said:

"The evidence is undisputed that Hall was not allured to climb over into the enclosure, and to climb upon the transformer rack. He was not an invitee by reason of the peculiar attractiveness of the transformer rack within the doctrine of attractive nuisance."

Also, see *San Antonio v. Morgan,* 46 S. W. 28. In this case the higher court said:

"We do not wish to be understood as holding that one is not liable for injuries to persons going onto his land uninvited when such injuries are intentionally inflicted, as where one digs a pit across a pathway over his land where he had reason to believe another will pass at night. In such cases the liability is not based upon the assumption that the owner owes a duty to the uninvited person to keep his premises reasonably

safe, but upon the fact that he owes a duty to such person not to intentionally injure him."

Damage to Crops

No person or company may cast materials on the land of another without paying to such property owner the full damages he sustained.

For instance, in *Desimone v. Mutual Materials Company,* 162 Pac. (2d) 808, reported January, 1946, it was shown that a property owner sued the Mutual Materials Company for damages to his crops and land caused by discharging water and sand on his land.

The higher court held the company fully liable, saying that the evidence sustained a judgment of $149.25 for damage to bean crop, $99.25 for damage to pea crop, $61.75 for damage to corn crop and $300 for damage to tomato crop.

Questions and Answers

[Mr. Parker will be glad to answer questions regarding legal problems of PIT AND QUARRY readers. Questions should be addressed to Leo T. Parker, Legal Editor, PIT AND QUARRY.—Ed.]

Legal Editor: Recently an employee sued us for back wages and penalties under the Fair Labor Standards Act. We do a retail business. Can you cite a late case in our favor?—D. S. & C.

Answer: According to the higher courts the Congress passed the Fair Labor Standards Act so that persons and employees should not be permitted to take part in interstate commerce without fair wages. For illustration, in *Walling v. Block Shoe Company,* 139 Fed. Rep. (2d) 268, it was shown that several employees who worked in the office and warehouse of a corporation as shipping and receiving clerks, doing clerical, bookkeeping and maintenance work, filed suit against the employer to recover back and overtime wages and attorney fees under the Fair Labor Standards Act. However, in view of Section 13 (a) the higher court refused to hold the company liable. This court said:

"It appears to us that the work of the employees in the present case is plainly incidental to the operation of a retail business. . . ."

Therefore, this higher court clearly held that retail sellers are not subject to the Fair Labor Standards Act.

Legal Editor: We do business exclusively with persons who live in this state. Are we required to pay our truck drivers the wages specified by the Fair Labor Standards Act?—S. S. C.

Answer: According to a late higher-court decision the answer to your question depends upon the kind of work done by these drivers. The applicability of the Fair Labor Standards Act is determined by the nature of the work performed by the employee.

See *Cannon v. Miller,* 155 Pac. (2d) 500, reported September, 1945, where employees serviced equipment which was operated to haul goods from one state into another. This higher court held that the employees who serviced vehicles used

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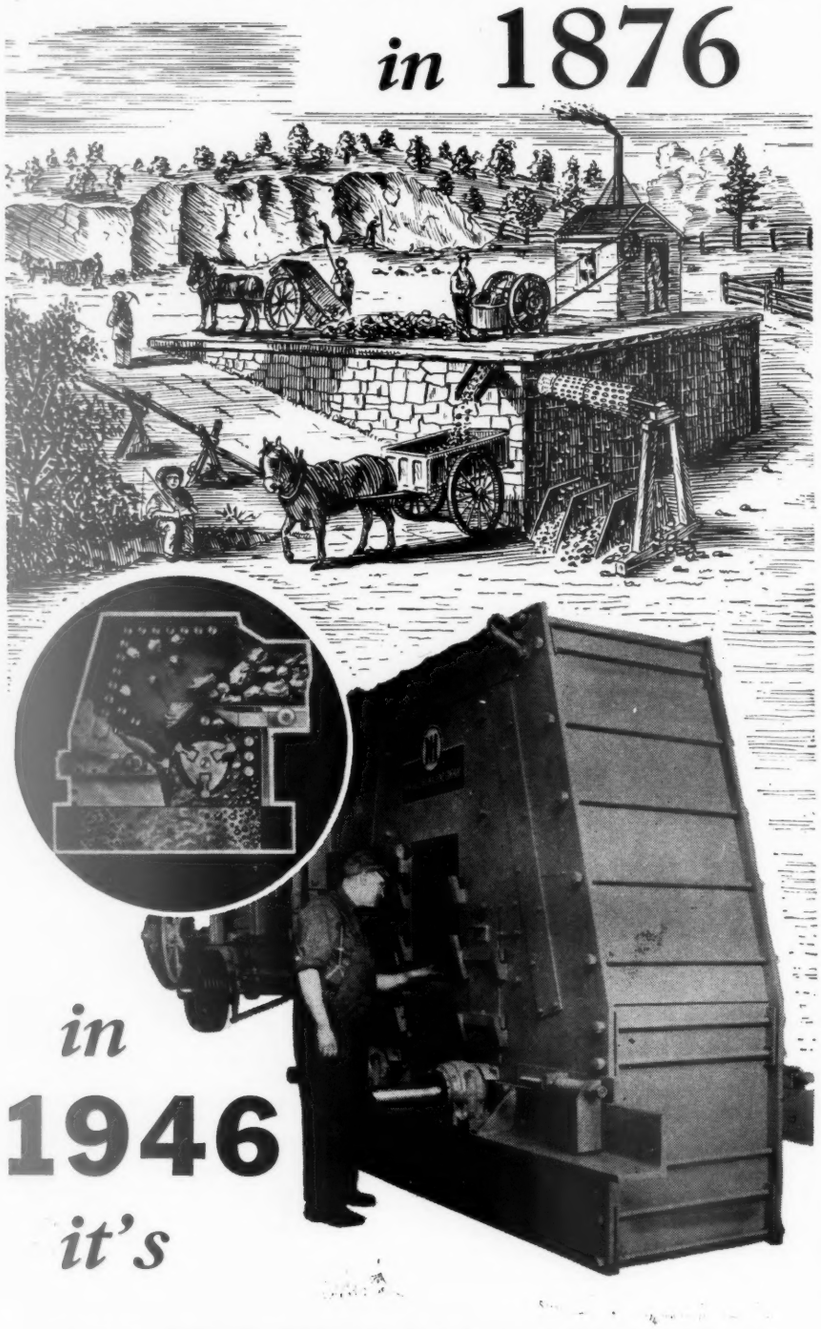

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Impact action of twin impellers reduces run of quarry stone as large as 30 inch to minus one inch . . . at the rate of 100 to 150 tons per hour with from 100 to 150 H.P.

For complete information on the Model 3030 and its revolutionary new operating principle, write Industrial Division, Dept. C.

NEW HOLLAND MACHINE COMPANY
NEW HOLLAND, PENNSYLVANIA, U.S.A.

in interstate commerce are within scope of the act. In this case the employer's business was principally intrastate. Therefore, if your drivers leave the state to load or unload merchandise they are under the provisions of the Federal wage law; otherwise they are not.

Legal Editor: We have a written contract with a motor transport company to haul freight at 5 cents per hundred less than the legal rates. Can we compel the company to fulfill this contract?—R. & F.

Answer: According to modern courts all transportation contracts made in violation to the rates authorized by legal commissions are void. In *Butler v. Bell & Refining Company,* 161 Pac. (2d) 559, reported November, 1945, a common carrier demanded that a shipper pay the difference between the transportation rate prescribed by the State Railroad Commission and a lower rate which the carrier agreed to accept when transportation service was rendered. This court held the contract void because the carrier agreed to transport merchandise at a rate lower than the legal rate. The court said: "The fact that the shipper has to pay the difference between a legally established rate and a lesser rate for which he was able to bargain privately, does not mean that the shipper is being regulated." Therefore, you cannot compel the carrier to fulfill the terms of your contract to haul freight at 5 cents per hundred pounds less than the legal rate.

Legal Editor, PIT AND QUARRY: I want to know at once if I pay men to do work on "piece," am I out of law making me pay social security, etc.?—Weber Quarry.

Answer: There is a *legal* difference between a mere employee and an "independent contractor." Some courts hold that an employer is not required to pay taxes as Social Security, State Workmen's Compensation, Unemployment Compensation, and the like on an "independent contractor." Also, generally an employer is not liable in damages for injuries to third persons caused by an "independent contractor." Moreover, an employer is not liable in damages, or for payment of compensation, under the State Workmen's Compensation Act, to an independent contractor killed or injured while performing his work.

However, according to a late higher court decision, the fact that employees are paid on a "piece" basis does not result in their being independent contractors, if the employer furnishes tools and inspects the work regularly.

For instance, in *Herbert v. Service Company,* 62 N. E. (2d) 506, reported 1945, it was shown that the Service Company hired two men. The testimony showed that for this work they were being paid $1.00 per square, which was to be divided between the two men. A foreman of the Service Company called at the job at least once a day and sometimes twice to inspect the work and direct the men what to do. Also, the company furnished ladders and other equipment for the workmen to use, as well as the transportation of the same by its own trucks.

The employer argued that the men

were independent contractors because they were paid $1.00 per square and were not paid on the hourly basis. The higher court refused to agree with this argument and granted compensation. This court said:

"Men employed by one engaged in the business of applying siding at a stipulated price per square, subject to inspection and supervision by employer, were 'employees' and not 'independent contractors.' "

However, if these men had furnished their own tools, and had not been subject to control of the employer, they would have been independent contractors.

Legal Editor, PIT AND QUARRY: Can you tell me how a court decides a damage suit when two boats have a collision? —Carry Sand and Gravel Company.

Answer: Modern higher courts consistently hold that a steamship whose course is predetermined may not be liable for a collision with another ship whose signal of approach was disregarded. See *Tidewater Associated Company v. United States,* 60 Fed. Supp. 376. Here a collision occurred between two cargo steamships.

In subsequent litigation the higher court held that failure of a steamship operator to keep a careful lookout, or to hear and answer signals from a vessel on a crossing course, is *not* a contributing cause to a collision where the steamship was the privileged vessel and required by rules of navigation to keep her course and speed.

Legal Editor, PIT AND QUARRY: What is the use of me paying for insurance for injuries to workmen if he can sue me for damages? What kind of law is this?—Kain Company.

Answer: According to a late higher court decision if an injured employee applies for compensation under the State Workmen's Compensation Act, he cannot sue his employer for damages.

See *General Motors Corporation v. Holler,* 150 Fed. Rep. 297, reported September, 1945. In this case it was shown that an employee was exposed to the inhalation of abrasive dust, poisonous metallic dust and fumes and he acquired a disease called pneumoconiosis. The employee sued his employer for damages on the contention that the latter was negligent in failing to take any of the recognized and approved measures to protect him from the injurious effects of the exposure to the harmful condition in which he worked.

The employer contended that the employee was obligated to accept compensation under the State Workmen's Compensation Act, and could not sue for damages.

Although the lower court held that the employee could sue his employer for damages, the higher court reversed the verdict because the employee had submitted his claim to the Workmen's Compensation Commission.

Legal Editor, PIT AND QUARRY: If an employee is injured, can he draw total disability compensation when he works at other places?—Security Contracting Company.

Esco 1½ yard All-Cast dipper on Thew-Lorain "77" on Woodland-Martins Bluff job. Contractor: Leonard & Slate, Portland, Oregon.

ESCO DIPPER BUCKETS

...dig faster...last longer!

ESCO dipper buckets don't need to be pampered. Whether they're working in hardpan, gravel, boulders or rock, they do a full day's work, take abuse in stride.

This was proved to contractors Leonard & Slate recently on their Woodland - Martins Bluff highway job in Washington state. On this job 2-1/3 miles of 4-lane highway required the excavation of 665,000 yards of rocky, root-infested earth. Says Contractor Fred H. Slate, *"Our operators found that Esco buckets dig fast, stand the gaff, require little attention."*

Esco dipper buckets give:

1. *Faster Digging*—more passes per hour. This is due to clean cutting front with integral tooth bases, and to flaring outside teeth which give clean, full bite. Tapered box allows quick, complete load discharge.

2. *Lighter Weight*—Use of strong, shock-proof manganese steel and hollow arch construction reduces weight without sacrificing strength. Less bucket weight, more payload per pass.

3. *Longer Life*—Esco design assures distribution of strain uniformly throughout the bucket. Parts subjected to wear and shock are made of manganese steel, reinforced.

ESCO makes two types of dipper buckets—the Cast-Welded for general purpose work and the All-Cast bucket for extremely hard service. They are fully illustrated and described in Esco bulletins 156 and 114B respectively. Get your copies from your nearest Esco representative or write us direct.

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For Continuous or Emergency Power. Consolidated electric plants can be quickly installed to provide extremely low-cost, dependable power. Gasoline or diesel-driven, these compact units are available in sizes from 5 K.W. to 75 K.W. AC or DC, all standard voltages. (Inquiries on larger sizes are invited.) Specify Consolidated. Users have found that emergency protection alone paid dividends greater than the cost of the complete plant.

For Portable Power. Consolidated builds two-wheel and four-wheel trailer-mounted units in sizes from 5 K.W. to 75 K.W. These units assure instant, on-the-spot power when you need it—where you need it. Our floodlight units, too, are a handy source of combined light and auxiliary power. These are available from 5,000 W. to 10,000 W. sizes. Just roll the unit to the job, start the power and go to work!

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CD-102

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Answer: According to a late higher court decision, an employee who can do any kind of work is not "permanently disabled."

For example, in *Byrne v. Progress Plate Making Company,* 43 Atl. (2d) 566, reported September, 1945, it was shown that an employee from exposure in his employment over a period of years, suffered a cerebral thrombosis. He quit his work on April 6, 1939, because of disability. Two days later there was a physical collapse, followed by loss of speech and complete paralysis of the right side of the body.

Within a few weeks the employee had recovered sufficiently to do easy work, and he accepted a job measuring the time of various machine operations with a stop watch. In view of this employment, the court modified the original award of compensation for total disability to an award for partial disability.

Legal Editor, PIT AND QUARRY: Can a surety on a general contractor's bond be compelled to pay for storage of goods, which is part of the cost of the goods to a sub-contractor? This is important for us to know.—Wood Quarry Company.

Answer: Generally speaking, the courts will hold a surety broadly liable on a general contractor's bond, irrespective of peculiar clauses in the bond.

For illustration, in *Indiana Plumbing Company v. Marcy Realty Corporation, Inc.,* 54 N. E. (2d) 263, reported June, 1944, it was shown that a building owner entered into a contract with a general contractor for the construction of a building. The contract provided against liens. Fred W. Fenneman was sub-contractor for the plumbing. A provision of the general contractor's surety bond was that if he failed to pay for subcontractor's materials and labor the latter could collect from him.

In subsequent litigation the higher court held that this provision did not limit the surety's liability to persons selling materials to sub-contractors. In other words, the surety was held liable to both sub-contractors and supply companies.

Therefore, since your storage charges are a portion of the cost of the goods and merchandise, supplied to the sub-contractors, the surety is liable to you.

Legal Editor, PIT AND QUARRY: What can you tell me about what is known as independent contractor, and when is he responsible for negligence of his truck drivers?—Road Construction Company.

Answer: Generally speaking, an independent contractor is personally and solely liable for injuries caused persons and private property, *provided* that the employer of such contractor does *not* have control of the contractor's employees.

Operations have been started at the Mineral Ridge Mine, located south of Salem, Kentucky, by the Mahoning Mining Company of Rosiclare, Illinois. At present the fluorspar is hoisted by steam, the dirt being trucked to the mill in Rosiclare; but a Caterpillar Diesel generator has been installed with the expectation of later adding an electric hoist.

TRAFFIC News Digest

CENTRAL FREIGHT ASSOCIATION DOCKET

Docket 79632 (2)—Limestone, agricultural, not ground or pulverized, unburned, in bulk, in open top cars, carload minimum weight 90 per cent. of marked capacity of car, except when car is loaded to full cubical or visible capacity, actual weight will apply. Establish on, from Woodville, Gibsonburg and Maple Grove, Ohio, to representative destinations in Northern Indiana, rates as shown in Exhibit A:

EXHIBIT A

	Rates in Cents Per Ton of 2,000 pounds		
	Proposed Rate (1)	Proposed Rate (2)	Proposed Rate (3)
Woodburn, Ind. ...	121	121	no change
Ray, Ind.	121	127	127
Helmer, Ind.	121	127	no change
New Era, Ind.....	127	127	no change
New Haven, Ind...	127	121	121
Stroh, Ind.	127	127	138
Huntington, Ind.; Lagro, Ind.	138	138	138
Roanoke, Ind.; Mardenis, Ind.	138	138	127
Elkhart, Ind.; Milford, Ind.	138	149	149
Granger, Ind.	149	149	160
Pine, Ind.	149	149	no change
Anderson, Ind.; LaFontaine, Ind., West Peru, Ind.; New Waverly, Ind.	149	149	149
Leesburg, Ind.; Wabash, Ind.; Hartman, Ind.	149	149	138
LaPorte Ind.; New Castle, Ind.; Hamlet, Ind.; Toto, Ind.; Burrows, Ind.	160	160	160
Wilkinson, Ind.; Keesport, Ind....	160	160	149
Fairmount, Ind. ...	160	149	149
San Pierre, Ind., Colburn, Ind.; Delphi, Ind.	171	171	160
Otis, Ind., Liverpool, Ind.; Tefft, Ind.	171	171	171
Dune Park, Ind....	171	171	182
Shelby, Ind.	182	182	171
Schneider, Ind.	182	182	182
Prairie Switch, Ind.	127	127	127

(1)—From Woodville, Ohio.
(2)—From Gibonsburg, Ohio.
(3)—From Maple Grove, Ohio.

ILLINOIS FREIGHT ASSOCIATION DOCKET

Docket IRC 511-359—Limestone, ground or pulverized, unburned, carload minimum weight 90 per cent. of marked capacity of car, except when cars are loaded to

the
RED
ELASTIC
COLLAR
protects
permanently
the RED ELASTIC COLLAR—denoting an ESNA product—is . .
. . permanently clinched to prevent turning under application and subsequent operational stresses
. . permanently secure against vibration effects. The bolt impresses does not cut full contact threads.
. . permanently tight against moisture. Bolt threads have 100% contact in collar and full metal seat
. . permanently elastic. The Red Collar retains its grip after repeated usage

What happens when this Red Elastic Collar becomes part of a nut? The nut becomes an ESNA Elastic Stop Nut! And it provides permanent protection for any detachable or adjustable assembly.

How?

First, an Elastic Stop Nut *locks in position anywhere on a bolt or stud.* Every bolt can be precisely prestressed to carry its full load. Positioning devices can be adjusted with precision. Vibration cannot disturb these settings—because the Red Elastic Collar eliminates all play between bolt and nut threads with its full contact, permanent grip.

Second, it *prevents thread corrosion.* Moisture is sealed out. Adjustment or removal is easy—any time.

Third, it *prevents thread damage.* Full thread contact in the Red Elastic Collar keeps the metal threads firmly seated. Axial play caused by vibration or stress reversal is dampened.

Fourth, it *prevents seepage of liquids past bolt threads.* Permits nut to be used as a sealing device.

Fifth, it *prevents maintenance waste.* The Red Elastic Collar, which does not injure the bolt or its plating, permits repeated usage.

Here's a challenge: Send us complete details of your toughest bolted trouble spot. We'll supply test nuts—FREE, in experimental quantities. Or, if you want further information write for literature. Elastic Stop Nut Corporation of America, Union, New Jersey. Representatives and Agents in principal cities.

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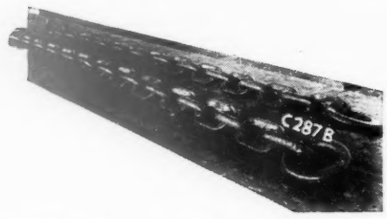
A Dragline Bucket is *as Good as the Metal in It*

Certain parts of dragline buckets must withstand continuous service abuse; in many cases what might be termed "cruel and unusual punishment."



C287B — Manganese steel dragline bucket pulling chains (U. S. Patent 2,103,972).

As the application of dragline buckets broadened — embracing stripping and working in such materials as hard shale, cemented gravel, conglomerate, hard pan and blasted rock—stronger and more durable buckets became a necessity. This problem has been met not only by improved design, but by the advantageous use of "the toughest steel known."

S50 — Complete manganese steel sheave blocks.

The wearing parts of a dragline bucket — such as the lip, teeth, chain, bucket and harness fittings, sheaves and blocks — must withstand heavy shocks and stresses and grinding abrasion. For these parts, tough, wear-resistant austenitic manganese steel has demonstrated an unequalled durability.

Long life with a minimum of time out for repairs, is built into dragline buckets equipped with Amsco manganese steel parts to withstand this destructive abuse. Several typical applications are shown in the pictures.

Similar savings in maintenance costs and lost productive time are effected by the use in the dragline machine itself of such manganese steel parts as crawler pads, sprockets, idlers and rollers.

R720—Manganese steel lip for 20-yard dragline bucket.

Amsco manganese steel castings as made for leading builders of draglines and shovels are described in Bulletin 641-S.

(Amsco Manganese Steel Castings are produced and sold in Canada by Joliette Steel Ltd., Joliette, Quebec.)

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full cubical or visible capacity actual weight will apply but not less than 60,000 pounds from Valmeyer, Illinois, to Galesburg, Ill. Present—$2.10 net ton. Proposed—$2.15 net ton.

Docket IRC 511-360—Agricultural limestone, having value only for soil treating purposes, minimum weight 90 per cent. of marked capacity of car except that actual weight will govern when car is loaded to full visible capacity. Orders will not be accepted for cars of marked capacity of less than 80,000 pounds from Pearl, Ill., to Beardstown, Ill., and points on the B&O R.R. West Springfield, Ill. Present—$1.32 net ton. Proposed 97 cents net ton.

DOCKET AND STATUS REPORT OF PRIOR SOUTHERN FREIGHT ASSOCIATION SUBMITTALS

Docket 34510 (shipper; suggested by carrier)—Establish rates on slag, product of phosphorus furnaces, in lump form (not granular), carload from Siglo, Tenn., to points in Indiana, Ohio, Michigan, Pennsylvania, New York, West Virginia, Illinois and Wisconsin.

Docket 34528 (shipper; suggested by carrier)—Establish joint through commodity rate of 477 cents net ton ground limestone, carload, 88,000 pounds, as to 277 cents of the rate and 90 per cent. of marked capacity of car (except when car is loaded to full cubical or visible capacity, actual weight applies) as to the remainder, from Sparta, Tenn., to Chicago, Illinois, to alternate with present joint rates of 495 and 490 cents net ton, respectively.

Docket 34536 (shipper; suggested by carrier)—Establish through commodity rates on ground limestone, carload to Fall River, Mass., from Cartersville, Ga., 735 cents and from Sparta, Tenn., 740 cents ton 2,000 pounds.

Docket 34561 (shipper; suggested by carrier)—Establish rate 425 cents net ton, clay, carload 50,000 pounds from Boaz, Clayburn, Hickory, Mayfield, Pryors, Viola, and Wickliffe, Ky., to Augusta, Ga.

SOUTHWESTERN FREIGHT BUREAU DOCKET

Docket 38543 (1)—Silica (white sand), Sand Pit, Mo., to Alton, Ill. To reduce present rate on silica sand from Sand Pit (north of Crystal City-Festus), Mo., to Alton, Ill., from $1.23 per net ton to 97 cents per net ton.

Docket 38569 (1)—Crushed stone, Glen Park, Mo., to Alton and Streator, Ill. To establish rates on crushed stone, carload, from Glen Park, Mo., to Alton, Ill., $1.05 per net ton and to Streator, Ill. $2.05 per net ton.

TEXAS–LOUISIANA FREIGHT BUREAU DOCKET

Docket 8382—Carrier's proposal to establish rate of $1.57 per ton of 2,000 pounds on silica sand, in box cars, or in covered hopper cars, carloads (Note A), minimum weight 90 per cent. of the marked capacity of the car except that when car is loaded to full space capacity actual weight shall govern, from Santa Anna to Waco. (Note A—Carriers are not obligated to furnish covered hopper cars.)

Rocket 8405 — Shipper's proposal to establish rates shown in Exhibit A, on lime, concrete mixture and stucco, in

mixed carloads, from El Paso Texas, to Alpine, Del Rio, Marfa, Sanderson and Sierra Blanca, Texas.

EXHIBIT A

	Rates in cents per 100 pounds		
	Col. A	Col. B	Col.C
Alpine, Texas	17	21	23
Del Rio, Texas.....	21	27	28
Marfa, Texas	16	20	22
Sanderson, Texas	19	23	25
Sierra Blanca, Texas..	12	15	17

Basis (a). Apply Col. A. rates to the actual weight of the lime, observing carload minimum weight of 50,000 pounds. Basis (b). Apply Col. B rates to the actual weight of the concrete mixture. (Note) Basis (c). Apply Col. C rates to the actual weight of the stucco. (Note—The weight of the concrete mixture and/or stucco may not be used to make up any deficit in the carload minimum weight on lime.)

TRUNK LINE ASSOCIATION DOCKET

Docket 43304 (shippers)—(A) Sand (other than ground or pulverized or naturally bonded moulding) and gravel, in open top cars without tarpaulin or other protective covering carloads. (B) Sand (other than ground or pulverized or naturally bonded moulding) in closed cars or in open top cars with tarpaulin or other protective covering, carloads, minimum weight 90 per cent. of marked capacity of car, etc., from Blossvale, Humaston and McConnellsville, N. Y., to Benton, Pa. (A) $2.20 and (B) $2.31 per net ton in lieu of current 6th class rates. Reason: Comparable with rates to and from other points.

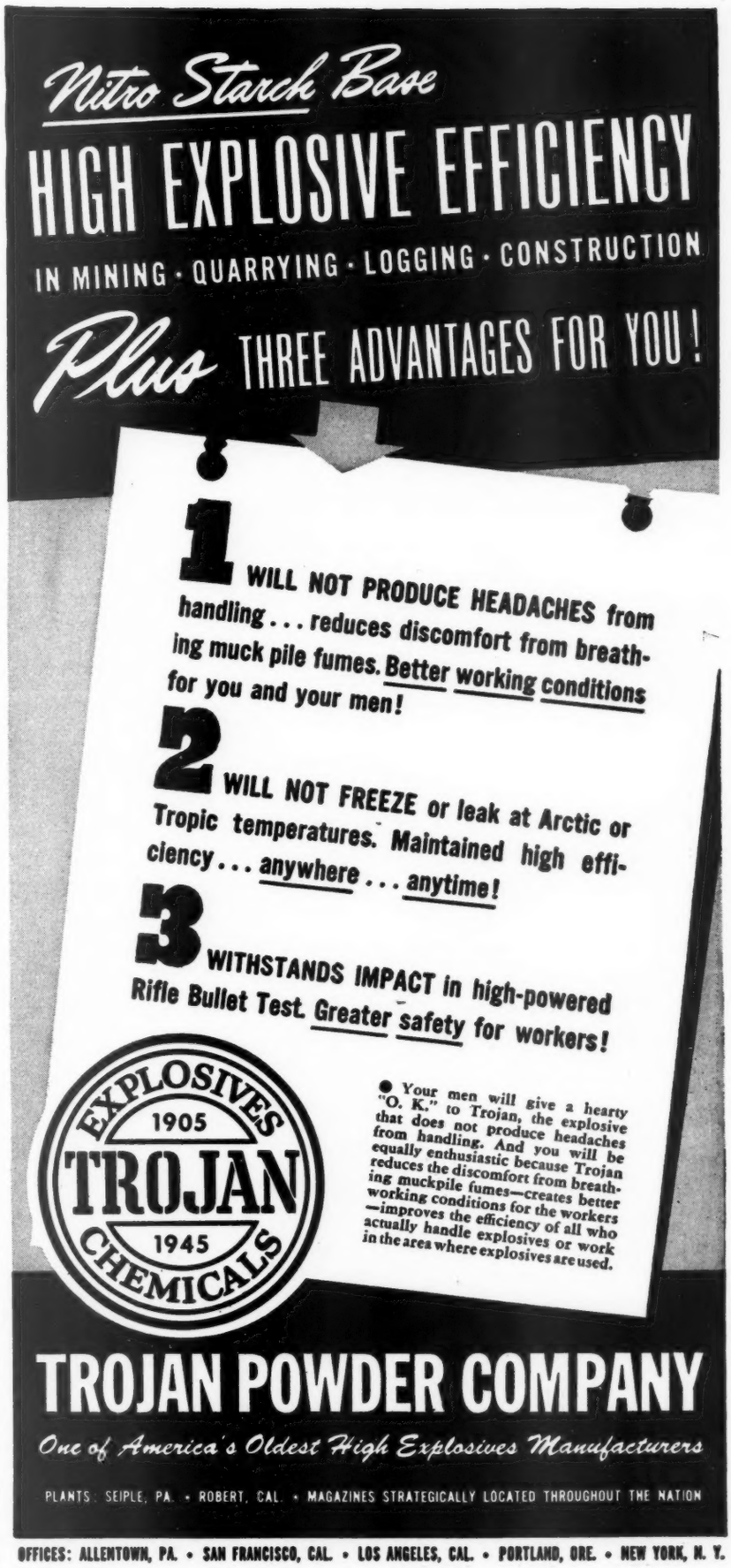
Docket M-4893 (shippers) — Limestone, broken, crushed, ground or pulverized carload minimum weight 60,000 pounds from South Bethlehem, N. Y. to Spring Valley and Monsey, N. Y., $1.71 per net ton in lieu of current sixth class rate of $3.80 per net ton. Reason: Comparable with rates from and to other points.

Docket M-4896 (shippers) — Limestone, other than ground or pulverized, rate applies only when shipped in open top equipment. During period of car shortage when open top equipment is not available and closed equipment is furnished at carrier's option, the rate provided for open top equipment will apply, minimum weight 90 per cent. of marked capacity etc., from Union Bridge, Md., to Chapman and Sandts Eddy, Pa., $1.60 per gross ton, in lieu of current sixth class rates of 19 cents and 21 cents per 100 pounds respectively. Reason: Comparable with rates applying from and to other points.

Docket 43340 (shippers) — Clay, crude, common or fire, carload, minimum weight 60,000 pounds, from Lock Haven, Pa., to Allegany, Md., $2.30 per net ton. Reason: Comparable with rates from and to other points.

Docket 43342 (shippers)—Quarry refuse, carload, minimum weight 80,000 pounds, from Auburn, N. Y., to Nichols, N. Y. $1.43 per net ton, in lieu of current 6th class rate of 16 cents per 100 pounds. Reason: Comparable with rates applying from and to other points.

Docket 43348 (shippers)—Granules, roofing, consisting of crushed slate, carload, and dust, slate, in packages, carload, min-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MORRIS CENTRIFUGAL PUMPS

imum weight 90 per cent. of marked capacity of car, rate of $8.58 per ton of 2,000 pounds, in lieu of combination rates, from all producing points in Trunk Line and New England territories as named in Items numbers 915 and 920 of SWL Tariff number 2-A, to Houston, Texas. Reason: Comparable with rate to other points.

Docket .43351 (carriers) — Limestone, crude, fluxing, foundry or furnace, in open top equipment, carload, minimum weight 90 per cent. of marked capacity of car, except when car is loaded to cubical or visible capacity, actual weight will apply, from Martinsburg, W. Va., and Inwood, W. Va., to Waynesboro, Pa., rate of $1.10 per gross ton, in lieu of existing 6th Class rate of $2.40 per net ton, from Martinsburg, W. Va. and rate of $2.80 per net ton from Inwood, W. Va. Reason: Comparable with rates applying from and to other points.

Docket 43352 (shippers) — Limestone, crude, fluxing, foundry, and furnace, carload, when shipped in open top equipment, minimum weight 90 per cent. of marked capacity of car except when car is loaded to cubical or visible capacity, actual weight will apply, from Inwood, W. Va. to Portsmouth, Ohio, and New Boston, Ohio, and from Bittinger and Thomasville, Pa., to New Boston, Ohio, rate of $2.20 per gross ton, in lieu of current 6th class rates. Reason: Comparable with rates applying from and to other points.

WESTERN TRUNK LINE NEW APPLICATIONS

Docket E-41-724—Stone, broken, crushed or ground, carload minimum weight—90 per cent. of the marked capacity of car but not less than 50,000 pounds. From—Ogilvie, St. Cloud and Cold Spring, Minn. To—Omaha, Nebr., and Kansas City, Mo. Proposed—Omaha, Nebr., 13 cents per 100 pounds. Kansas City, Mo., 15 cents per 100 pounds. (By shipper.)

Docket E-8-626—Clay, crude or ground, not otherwise indexed by name in Western Classification No. 71, carload minimum weight 60,000 pounds, from Bentley Spur, Clay Spur, Colloid Spur, Jerome, Moorcroft, New Castle, Osage, Pedro and Upton, Wyoming, to Mobile, Alabama. Proposed—49 cents per 100 pounds. (By shipper.)

Docket E-41-725—Stone, crushed, from Cold Spring, Ogilvie, Rockville, St. Cloud and Sauk Rapids, Minn., to Chicago, Ill., minimum weight present 100,000 pounds. Proposed, marked capacity of car. (By shipper.)

Docket X-C-17-122 — Superphosphate, other than ammoniated, in bulk, carload, from Tampa, Florida, to Minneapolis, Minnesota Transfer and St. Paul, Minn. Rates—Present: $12.35 per net ton. Proposed—$9.90 per net ton. (By shipper.)

Docket E-43-199 — Gypsum, crude or ground (having value for purposes of soil treatment only), carload minimum weight 50,000 pounds from Thermopolis and Cody, Wyoming, to stations in Nebraska and South Dakota. Proposed—To establish rates which reflect 110 per cent of the Scale IV, ICC Docket 8182 cement rates. (By shipper.)

NEW MACHINERY and SUPPLIES

● Dual Center Truck Assembly

Cook Bros., of Los Angeles, present a dual-center chain drive rear-wheel truck assembly. This unit, which can be installed on any make or model truck, is

Chain drive unit.

claimed to have four distinct advantages: increased hauling capacity, greater flexibility, better traction and more power. Three models are available: model CCD3-15, rated at 10 tons, for trucks with engine displacement under 300 cubic inches; CCD3, rated at 12 tons, for engine displacement up to 400 cubic inches; and CHD2, rated at 16 tons, for engine displacement over 400 cubic inches. The manufacturer recommends these units for trucks operating over rough or soft terrain with heavy loads. Included among the trucks using this 4-dual-wheeled assembly are ready-mix concrete trucks, truck-mounted cranes and materials hauling vehicles.

● Larger Tires for Scrapers

R. G. Le Tourneau, Inc. of Peoria, Ill., has announced it is equipping its Tournapull-drawn LP "Carryall" scrapers with 21.00 by 24 tires. According to the manufacturer, this larger size tire provides increased flotation, reduces rolling resistance, and improves off-the-road operations. Scraper clearance has been increased 4 inches over that of scrapers using the smaller tires. Interchangeability between front and rear tires is now possible, as a similar tread is used for both traction and trailing purposes.

● New Rock-Splitting Tool

The Maloney "Boulder Buster" is described by the manufacturer, the Universal Pneumatic Tool Co. of St. Louis, as having the following advantages—"no explosives, no fuse, no noise, no spalls, no flying rock, no shattered rock to be rejected. . . ." The tool is an integral unit

Tool for breaking boulders.

of treated steel operating in movable slides which expand in parallel lines contacting the inner surface of the drilled hole. Immediate breakage is claimed by the manufacturer, who adds that it is possible to control the direction of breakage by placing the tool in the drilled hole so that the opening between the two slides points in the direction of the required break.

Two advantages particularly stressed are that the Boulder Buster eliminates secondary shooting and that work may proceed without interruption since there is reportedly no flying rock. The Boulder Buster is made in four sizes.

● One Unit — Three Models

The Osgood Company of Marion, O., is offering its "Type 100" unit, available in three models. Model "1000" is a standard shovel equipped with a 2½-cubic-yard bucket; model "1007" is a dragline with booms available up to 85 feet; model "1006" is a high-boom stripping shovel with a 45-foot boom, 35-foot handle, and a 2-cu.-yd. dipper. All models are fundamentally alike in design and construction. The five hand levers and two foot pedals, which are within convenient reach of the operator, are said to provide positive control of the principal operations of the Type 100. Air controls are an added feature of this unit.

The manufacturer states that the latest designs and developments are incorporated in the Type 100, including full-view cab; wide, heavy crawlers; well-balanced arrangement of machinery; and electrically-welded steel boom construction. A choice of diesel, gasoline, oil or electric power may be used.

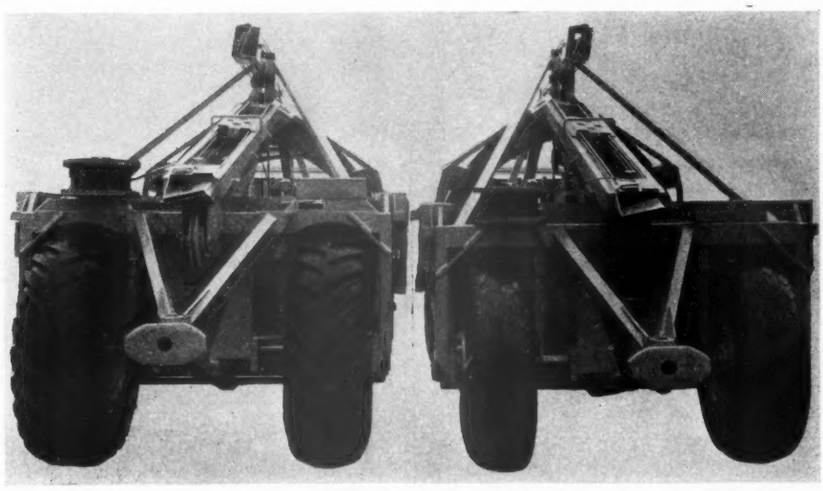
Standard shovel with 2½ cu.-yd. bucket.

● Heavy-Duty Tire

For blowout protection, the Firestone Tire & Rubber Company has developed a new industrial wire-corded heavy-duty tire. Fine metal wire cord with a very high tensile strength is firmly bonded with rubber to provide the foundation of the new tire. Because of the strength of the metal, fewer plies are required, permitting thinner side-walls. This feature, according to the manufacturer, contributes to cooler running. Heat is carried away from the hot spots within the tire and dissipated by the metal. The strong construction and cool running features of this tire are said to provide blowout protection and increased tread mileage.

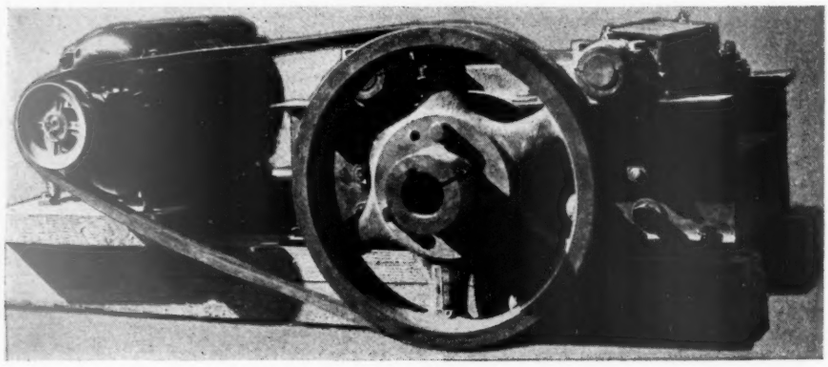
● Crusher for Portable Plants

A new "Center Roll" secondary or finishing crusher, requiring low head room, has been announced by the Adams



Left: Scraper, equipped with 21.00 x 24 tires. Right: Scraper with 18.00 x 24 tires.

Engineering Company of Monticello, N. Y. Though not yet in production, this crusher is expected to find a place in stone plants, gravel plants and mines, and is claimed to be particularly suited for portable plants.



New secondary crusher requiring low head room.

Among the features claimed are: rotational balance, which reportedly permits higher speeds with minimum vibration; protection from choking, packing and tramp iron; a wide range of adjustment; economic use of and easy removal of manganese parts; forced-feed, circulating oil lubrication; direct drive with flat or V-belts; and welded steel frame design for maximum strength and minimum weight. Crushing is accomplished by an oscillating roll between adjustable jaws. It is also claimed that any type of material which can be successfully handled by a gyratory crusher can be processed by the Adams Center Roll crusher.

● Method for Testing Belts

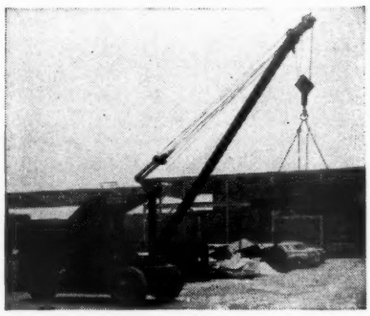
An easy method to determine whether any rubber V-belt, flat belt, hose or other product is static conductive has been developed by technicians of the B. F. Goodrich Company, which was among the first firms to develop rubber compounds which conduct static. The company recommends that all static conductive rubber belts be tested for conductivity at regular intervals of at least once monthly. Static conductive rubber belts have proved especially valuable in operations where a spark might set off an explosion.

A simple assembly, using a 5- or 6-foot length of lamp cord with standard rubber socket plug, a 2-watt neon bulb, two ordinary clamps or metal prongs and two insulated handles can be readily constructed for the tests. One of the wires of the cord is cut, the neon bulb inserted in a standard base, the insulated handles installed near the end of each wire and the prongs attached to the wires.

To make the test, part of the belt or other rubber product is moistened with water, leaving a dry section eight to twelve inches long between the moistened surfaces. The testing assembly is plugged into any 110-volt a.c. line, and the clamps or prongs applied to the moistened surfaces, with the dry in the middle. If the bulb glows, the rubber product is a static conductor. The belt or other article under test must be suspended in the air between the clamping points, or rest on a surface which has been insulated.

● One-Man Mounted Crane

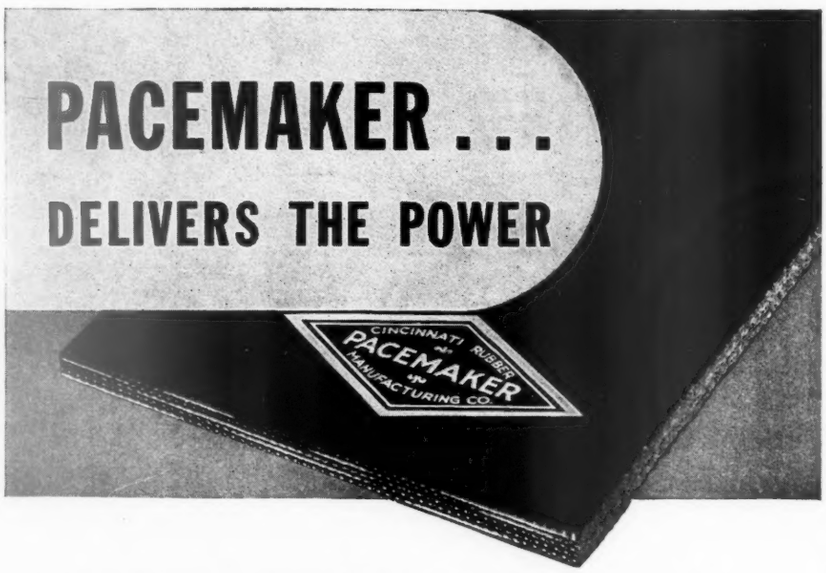
A one-man operated cargocrane, Model YC-5, is now offered by the Link-Belt Speeder Corporation of Chicago,



Crane with short turning radius.

Illinois. The goose-neck boom, 20-feet in length, can be furnished either in one piece or telescopic type. It is said to

PACEMAKER . . .
DELIVERS THE POWER



Pacemaker transmission belting is well-known . . . it has a string of performance records behind it "as long as your arm". It is the great all-purpose belt that has been building records for many years on all types of drives . . . in peace and war production. You can count on Pacemaker to maintain its high reputation for dependability in the big production era ahead.

Note bonding of rubber. Separation of plies during operation is practically impossible.

When you buy Pacemaker you get . . .

1. Long service.
2. Practically no stretch or slippage.
3. Resistance to atmospheric conditions.
4. No separation of plies.
5. Exceptional flexibility.

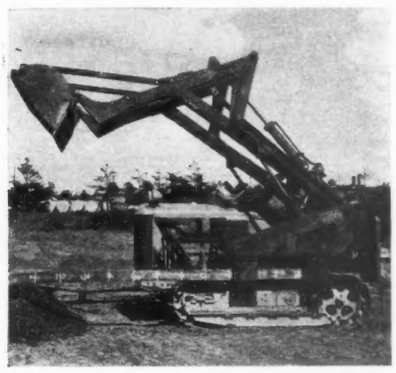
On your next order for transmission belting specify *Pacemaker.*

CINCINNATI
RUBBER MANUFACTURING CO.
Cincinnati, Ohio

be capable of lifting from 2,900 pounds at a 15-foot radius up to 15,000 pounds at a 3½-foot radius. The chassis, on a 10-foot, 9-inch wheelbase, has a short turning radius, and permits a boom swing of 210 degrees.

● Front-End Loader

A hydraulically operated front-end loader, known as the Drott "Hi-Lift Loader," is introduced by the Drott Manufacturing Corp. of Milwaukee, formerly the Hi-Way Service Corporation. Features of the loader include a 1¼-cu.-



Operates on finger-tip control.

yd. shovel and a 10-foot, 8-inch lift. It dumps approximately 5 feet ahead of the tractor, which is an Oliver "Cletrac." The shovel bucket is operated by finger-tip controls while the tractor is in motion or standing still. The load is not carried on the tractor, but is transferred to the shoes, which are making ground contact, and semi-skidded to its destination. A depth gauge is provided to permit setting the shovel for any desired cut. When placed in a vertical position, the shovel can be used for light bulldozing of loose materials.

● Mechanical Arm for Trucks

A mechanical arm, to be used as a horizontal non-swivel type boom on power trucks, is offered by the Elwell-Parker Company, of Cleveland. The device is recommended for lifting or trans-

Vertically moving arm.

porting single objects to which a hook, chain, rope or cable may be attached. At the lowest point the hook is 22 inches above the floor or ground level, and 8 feet at the highest point. The arm moves

PERFORATED METAL SCREENS
FOR SAND, GRAVEL STONE, ETC.
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Any size or style screen, in thickness of steel wanted with any size perforation desired.
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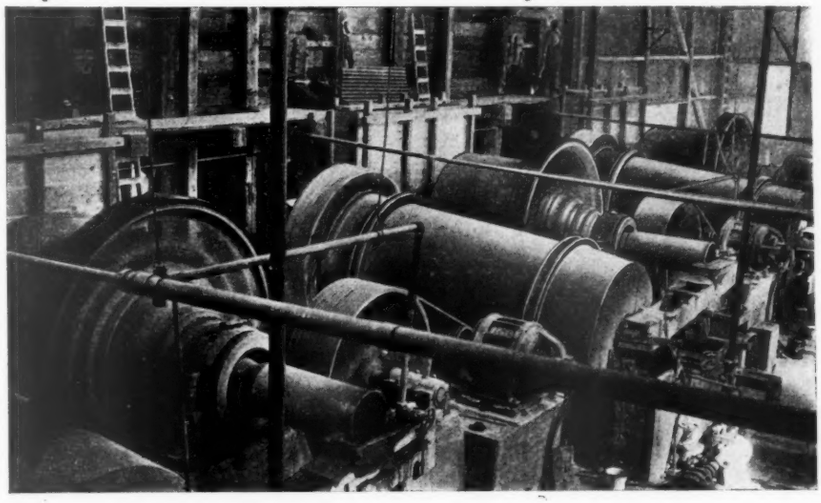
for every classifying operation, specify matched units



HARDINGE COUNTER-CURRENT CLASSIFIERS AND HARDINGE CONICAL BALL MILLS

Hardinge Counter-Current Classifiers in closed circuit with Hardinge Conical Ball Mills make an excellent compact layout for a stone plant. The classifier, with its one moving part, doesn't wear out. Average life of classifier lining is 10 years on hard siliceous materials. Control of oversize fineness by counter-current action of the classifier insures maximum overall production from the complete grinding circuit—thus increasing mesh tons per horsepower in a system where maintenance is practically nil.

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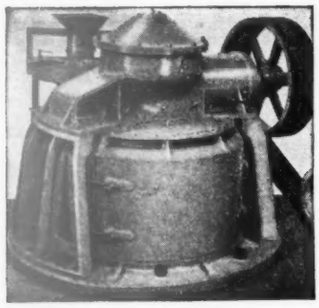

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Hundreds of Installations . . Use Bradley Pulverizers

for the reduction of

AGRICULTURAL LIMESTONE
Cement Materials and all
Dry, Non-Metallic Minerals

CAPACITIES: 1 TO 50 TONS PER HOUR
FINENESSES: 20 TO 350 MESH

BRADLEY PULVERIZER CO.

ALLENTOWN, PENNA.

FOR PUMPING
ANY MINUS ¼" MATERIAL
WHICH WILL FLOW
BY GRAVITY

No Feed Box or Intake Head Required

In the Denver Vertical Centrifugal Sand Pump* the feed flows downward by gravity into the pump bowl and down onto the runner. The unrestricted vortex action eliminates the need of a feed box or intake head.

Handles Coarse Material Without Plugging Up

The positive downward flow of feed directly onto the runner permits the pumping of difficult-to-handle pulps containing coarse material without plugging up the pump.

Ideal For Pumping Frothy Pulps

Frothy pulps usually present difficult pumping problems because the froth builds up on top of the pulp. The downward flow of feed with the positive suction action eliminates any possibility of air pockets forming in feed pipes.

*Patented and Patents Pending.

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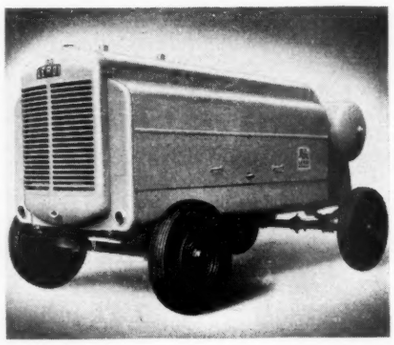
vertically, with its shoulder riding in the upright columns of the truck. It is available in lengths of 60, 66, and 72 inches and may be made interchangeable with a platform for handling multi-unit loads.

● New Portable Compressor

The Le Roi Company of Milwaukee recently announced its new line of portable air compressors known as the "Airmaster Series." Of the ten models comprising the series, the 60 to 315 are Le Roi gasoline engine-powered, and the

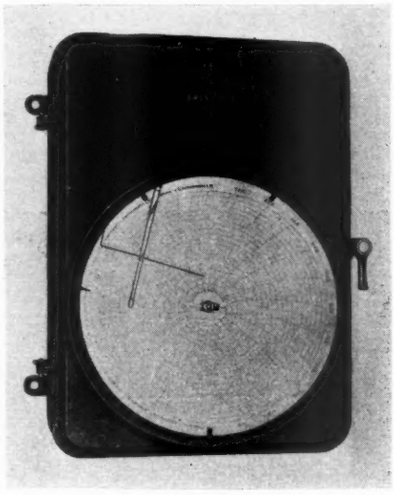


One of 10 new models.

105 to 500 are powered with a full 4-cycle diesel engine. Features claimed for machines in this series include a full-length tool box; push-button electric starting; 4-wheeled chassis, spring mounted with automotive steering; and the "Le Roi Econotrol" speed-pressure governor.

● Meter for Running Time

A new instrument for recording machine running-time has been developed by the Bristol Company, Waterbury 91, Connecticut, for checking machine performance. The instrument records the operating or "on" time of production



Meter showing chart.

machinery and other similar equipment. The chart record gives the total "on" time in hours, minutes, and seconds for a given period. "Off" periods are also shown on the chart.

The running-time readings are magnified in such a way that the total operating time of a machine can be easily and accurately determined.

TRADE NOTES

Carl E. Nagel has been appointed manager of editorial service, according to an announcement by Charles A. Scarlott, manager of Engineering Publications of the Westinghouse Electric Corporation. Mr. Nagel, a veteran of World War II, will be responsible for the company's technical and trade magazine articles.

C. E. Nagel

He joined the Westinghouse staff in 1941.

E. I. LaBeaume, who formerly was editor of *Explosives Engineer*, a Hercules Powder Co. publication, has been named manager of the Industrial Advertising Division of the company's advertising department. He succeeds Frederick E. Schmitt, Jr., who recently resigned.

F. H. Kilberry

Nordberg Manufacturing Co., through its president, Robert E. Friend, announced the election of F. H. Kilberry to the position of executive vice-president and director, to fill the vacancy created by the resignation of C. E. Stryker.

Mr. Kilberry was president of the Atlas Imperial Diesel Engine Co. of Oakland, Calif., from 1938 to May, 1945, when he resigned to accept a position with Nordberg.

Mr. Stryker has accepted the position of president of the Adel Precision Products Corp. of Burbank, Calif.

Chester Abbey

Lieutenant Chester Abbey, U.S.N.R., has been appointed research engineer of the Gypsum Association, to direct projects and investigations now under way and to inaugurate new research efforts.

Lieutenant Abbey will conduct tests on established gypsum products and seek to devise new uses for gypsum in the current nation-wide building boom. Gypsum's fire-safety, weather-resistance and structural strength will be qualities singled out for special tests.

All the stock in the Straub Manufacturing Co., Inc., of Oakland, Calif., formerly held by W. B. Straub and family, has been purchased by the following persons: J. R. Kueneman, president and general manager; C. P. Kenville, vice-president; Don Kueneman, vice-president; Alma Harrell, secretary.

The business will be continued under the original firm name and management. In addition to the present line of crushing and milling machinery, new items, to be announced later, are to be added.

The Traylor Engineering & Manufacturing Co. of Allentown, Pa., has announced the appointment of Lt. Col. Clyde W. Spears as special sales engineer. Graduating from the Colorado School of Mines in 1931 with a degree in E. Met., he also pursued post-graduate studies in chemistry at the California Institute of

Lt. Col. Clyde W. Spears

Technology. Prior to his army service Colonel Spears was with the Department of Agriculture for a period of seven years on flood control projects.

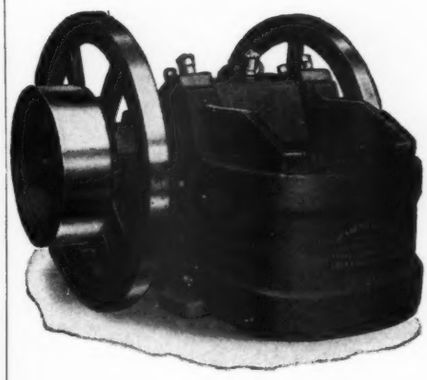
Colonel Spears entered the service in May of 1942 and was assigned to the 833rd Engineering Aviation Battalion. After the usual training period he was sent to England with his unit to build large bomber air bases. He went into France on D plus 9 with a Transportation Corps and was with the advance of the Allied Armies which finally ended in Munich, Germany. Colonel Spears was awarded a bronze star medal for meritorious service. He received his discharge from the army on February 12, 1946.

Herman A. Everlien, general sales manager of the Mechanical Goods Division of United States Rubber Company, died suddenly of a cerebral hemorrhage

Who are the important non-metallic minerals producers in New York—California—Minnesota? Only the Pit and Quarry Directory can tell you.

FARREL BACON
CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants. Engineering Service.



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ANSONIA, CONNECTICUT

It's An Easy Job for
FLIGHT-VEYOR

Flight-Veyor With HIGH-BOY attachment

An all purpose Industrial Conveyor that's a real time and money saver. Moves ashes, cinders, grain, chemicals, metal, aggregate, clay, coal, etc. Equipped with 1¾" high, chain drag-flights. Four sizes: 8 and 12 inch widths, 13 and 20 foot lengths. Raises material up to 9 feet with 13 foot model and up to 14 feet with 20 foot size. Where a belt is desirable, use CON-VAY-IT.

Manufacturers of Coal-Veyor, Coal-Veyor, Jr., Con-Vay-It, Flight-Veyor.

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Please send full information on
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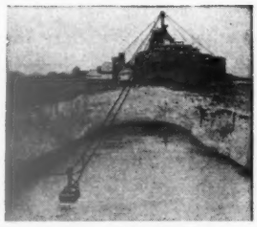
SAVE LABOR! SAVE POWER! SLASH COSTS!



Sauerman Cableway at Work in Deep Wet Pit

Sauerman Scraper Moves Gravel from Hill to Crusher

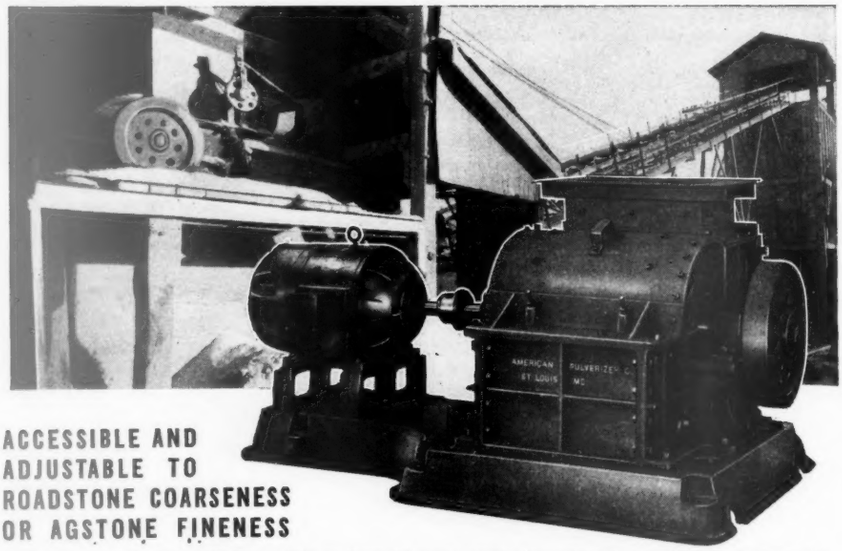
MAJOR savings result when Sauerman Scrapers and Slackline Cableways are used in sand and gravel excavation, stockpiling and other material-handling jobs where the long working range of these machines can be employed to advantage.

With one man at the controls, and with a relatively small expenditure of power, a Sauerman machine will dig, haul and automatically dump a large hourly tonnage of any class of earth or bulk material. Moreover, the first cost of the equipment is moderate and upkeep is simple.

Tell us about your material-handling problems. If we think Sauerman equipment will meet your needs, we will offer suggestions and send you our catalog.

SAUERMAN BROS., Inc., 534 S. Clinton St., CHICAGO 7

FOR FLEXIBILITY—AMERICAN CRUSHERS



ACCESSIBLE AND ADJUSTABLE TO ROADSTONE COARSENESS OR AGSTONE FINENESS

Americans offer custom-built models to best fit your particular operation and type of stone in your quarry. High tonnages in the one-step or circuit operations. Resistant to clogging. Capacities up to 250 TPH. Ask any of the many who operate Americans.

Send for bulletin on Rock Crushing Data.

American PULVERIZER COMPANY

Originators and Manufacturers of Ring Crushers and Pulverizers

1059 MACKLIND AVE.
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on February 21 at his home in New York City.

Mr. Everlien had been associated with the rubber industry for 43 years. He began his career as a clerk in the Chicago office of the Revere Rubber Company, a firm later consolidated into the United States Rubber organization.

Stuart Halliday

Stuart E. Halliday, who for the past nine years has been connected with the Novacal Chemical Co. as a salesman and sales manager, has joined Consolidated Diesel Electric Corp., to supervise sales and advertising.

The Consolidated Diesel Electric Corp. has announced the removal of its plant to its own building at 230 East 8th Street, Mount Vernon, N. Y.

R. J. Nymberg

R. J. Nymberg has been named sales manager of the hoist and body division of Gar Wood Industries, Inc. of Detroit. Mr. Nymberg joined Gar Wood in 1921 as a body engineer and was made sales engineer in 1932.

Other Gar Wood appointments announced are as follows:

Henry Husbands, assistant to Amos E. Heath, district manager of the company's general line in Washington.

Ross Miller, manager of Gar Wood's Philadelphia branch (hoist and body division), succeeding A. E. Hilderley, retired.

Edward F. Kreutzfeld, service manager of the hoist and body division, succeeding Mr. Miller.

William F. Keeton, director of the company's newly-created advertising department.

Charles J. Hoffman, head of Gar Wood's new export department.

J. V. Eakin

The Fawick Airflex Co. of Cleveland announces the appointment of John V. Eakin as manager of its new sales and service office at 2509 Commerce Street, Dallas, Tex.

Mr. Eakin has been manager of the clutch service at the Cleveland Fawick plant for the last two years.

John S. Langwill, who was formerly associated with the Bucyrus-Erie Co. of South Milwaukee, Wis., has become manager of dredge sales at the Joshua Hendy Iron Works, Sunnyvale, Calif.

E. S. McCormick, formerly Lieutenant McCormick of the U. S. Navy Seabees, has been appointed district representative, for the American Hoist & Derrick Co. of Chicago.

E. S. McCormick

Mr. McCormick's experience gained while in the Seabees adds greatly to his ability in accurately expediting materials handling problems. Prior to entering the service, he was associated with the American Hoist & Derrick at their home offices in St. Paul.

K. F. Park

Advancement of Kenneth F. Park, sales development manager of the Caterpillar Tractor Co., to the newly-created post of engineering consultant on all matters pertaining to the earth-moving field, has been announced by H. H. Howard, Caterpillar general sales manager.

In his new capacity, Mr. Park will serve three sales divisions which include the United States and Canada. He joined Caterpillar in 1944 to take charge of the sales department.

Trade Literature

The pieces of literature listed below can be obtained direct from the manufacturers named, or requests can be addressed to Pit and Quarry's "Service to Readers" Department.

PULVERIZERS. 12 pages. Describes Prater dual-screen pulverizer. Prater Pulverizer Company, Chicago, Illinois.

DOLLAR AND CENTS IN YOUR POCKET! Collection of letters concerning the Eagle "Swintek" Screen Nozzle Ladder. Eagle Iron Works, Des Moines, Iowa.

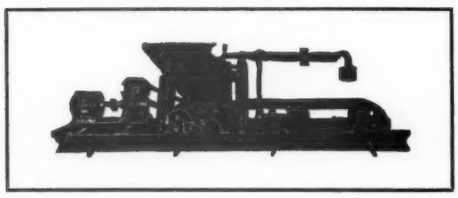
THE EAGLE "SWINTEK" DREDGING LADDER. Catalog 745. Eagle Iron Works, Des Moines, Iowa.

ROPE DOPE. A series of nine bulletins. (No. 1 now available.) Subjects: Replacement of Wire Rope (two parts), Lays of Wire Rope, Types of Wire Rope, Factors on Rope Life, Installation of Wire Rope, Care of Wire Rope, Abuses of Rope in Use and Figuring the Working Load. Union Wire Rope Corporation, Kansas City, Mo.

KRITZER, A GREAT NAME IN LIME. 8 pages. Descriptive booklet. 8 types of new hydrators. The Kritzer Co., Chicago.

CONVEYORS. A 4-page illustrated pamphlet describing typical installations, and materials which can be handled by air-activated conveyors. Robinson Air Activated Conveyor System, New York.

Controlled Production



with Schaffer Poidometer

The modern, precision machine that conveys, feeds, weighs and records automatically . . . assuring accurate production control in handling of raw and finished materials.

Poidometers combine high speed and extreme accuracy in weighing, mixing, blending and proportioning. These machines are extremely durable in construction and insure record output and product uniformity with low operating cost.

Write for Catalog No. 5

SCHAFFER POIDOMETER CO.

2828 SMALLMAN STREET - PITTSBURGH 22, PA.

Eyes say "Satisfied," behind MONO Goggle

• All day comfort is realized through its light weight (just over an ounce), rolled edges and shape that fits facial contours. The adjustable headband holds the goggle snug without pressure. Two nose sizes assure proper fit.

• Overall eye protection because of large lens firmly anchored in frame but easily replaceable. Resists impact equal to steel ball traveling at 225 ft. per sec. Adequate protection for chipping, grinding, spot welding, etc.

• Available in standard and extra large sizes; curved and flat lens styles; clear or Willson Tru-Hue* green plastic; ventilated or non-ventilated; clear, frosted or green frame. Can be worn over prescription spectacles with comfort.

WILLSON 75 YEARS

For help on your eye-protection problems, get in touch with your Willson Distributor or write for information.

*REG. U. S. PAT. OFF.

GOGGLES • RESPIRATORS • GAS MASKS • HELMETS

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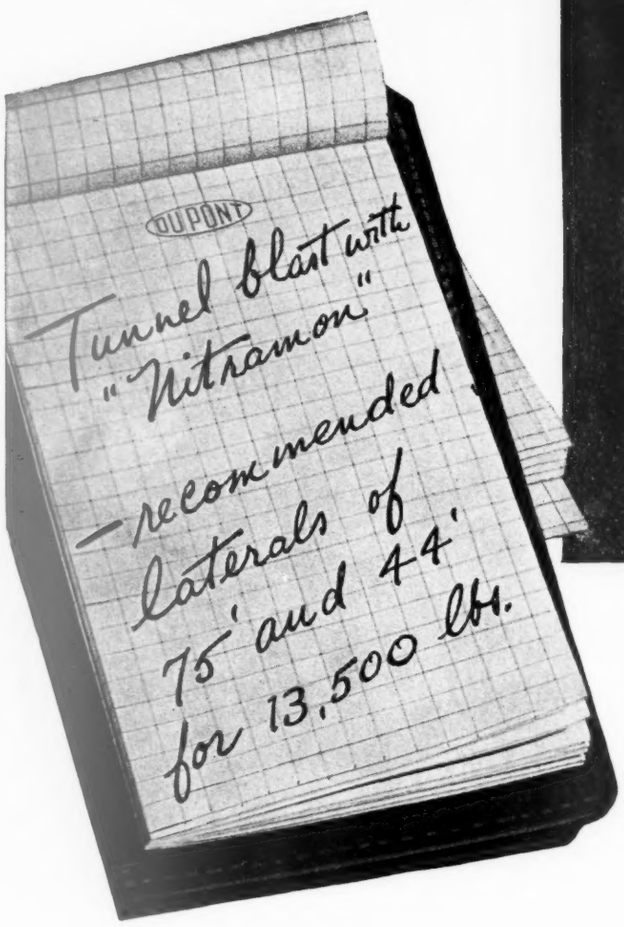
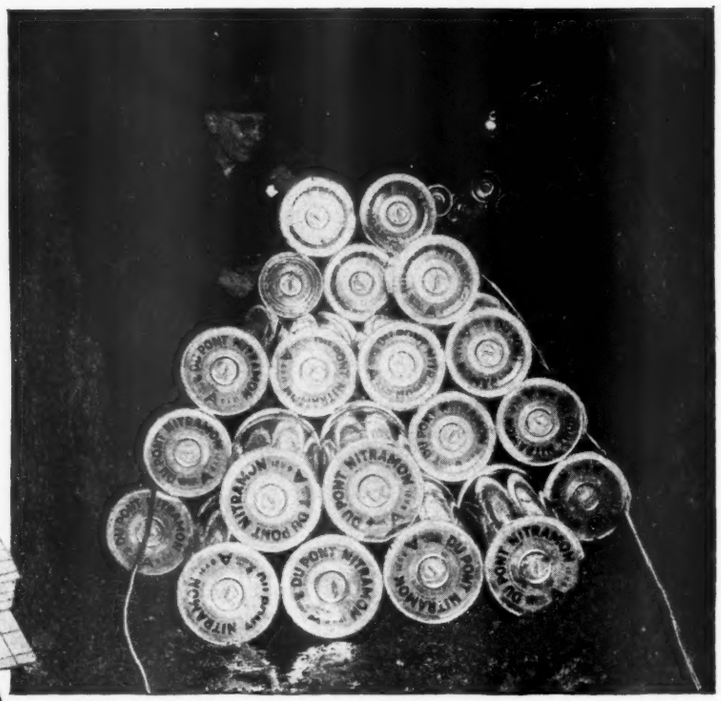
(Notes from a Du Pont Technical Service Man's Field Book)





DU PONT TECHNICAL SERVICE MAN inspects "Nitramon" charge resting in water in one of the units. Note electric light.

BEHIND THESE NOTES—a story of Du Pont Service and "Nitramon"... the safest blasting agent.* In a northern Maryland quarry, a 70-foot entrance tunnel with 75′ and 44′ laterals was being driven to obtain jetty size and rip-rap rock.

The entire job was laid out and supervised by a Du Pont Technical Service Man. He recommended the tunnel layout—computed the expected tonnage yield — planned location and size of the individual charges. From note book in his own words:

"We began loading 'Nitramon' at 7 A. M. Tunnel lighted every 10 ft. by 110-volt line, materially speeding up loading. Tunnels stemmed with sand where crossed by seams in stone formation—shot fired 9:45 A.M. next day. Top pulled clean to rear wall—large proportion of jetty and rip-rap sizes spread over quarry floor. Actual yield will exceed estimates by 20,000 tons. All concerned well pleased —site selected for next blast."

Here's another successful shot that shows why more and more quarry operators are turning to "Nitramon." This economical blasting agent is easy to use and safer. If *you* have a problem of quarry blasting . . . use "Nitramon" and call on a Du Pont Technical Service Man to help you. E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Delaware.

* * *

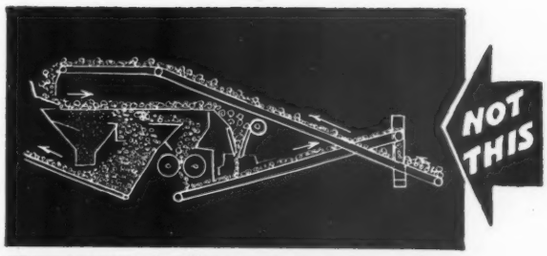
*"NITRAMON" cannot be detonated by the strongest commercial caps, open flame, friction, falling objects or impact of rifle bullets. Yet, a combination of "Primacord," and "Nitramon" Primer readily detonates this safest blasting agent.

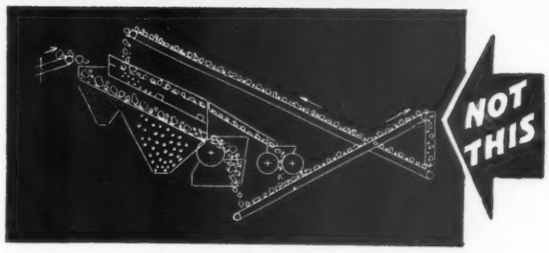
DU PONT "NITRAMON"

DU PONT
REG. U. S. PAT. OFF.

A Product of Du Pont Explosives Research

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*





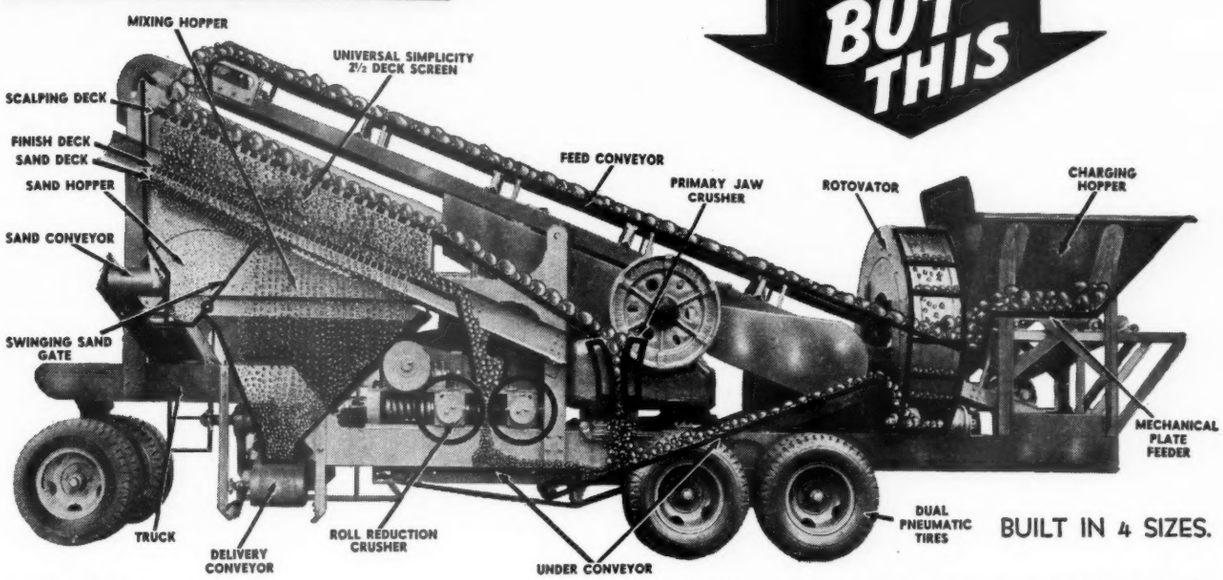
UNIVERSAL CRUSHING PLANTS ARE

ENGINEERED TO THE NTH DEGREE!

Here's a Typical Example—

There are three principal methods of screening material in a gravel or rock crushing plant. Universal engineers studied them all and applied the Scalping Deck Method of screening to Universal portable and stationary plants.

BUT THIS



BUILT IN 4 SIZES.

Not This

Horizontal screening method

Material travels across screen too slowly, increasing h.p. requirements, screen wire wear and blending, lowering plant output.

Not This

Bottom deck feeding method

Pit run material all passes over finish deck, increasing wear on its small wire. All material retained by finish deck goes through jaw crusher, increasing jaw wear and decreasing output. Most of the product of the jaw crusher goes to rolls, increasing roll shell wear and h.p. requirements. Plate between decks makes screen hard to balance, increases plant vibration.

Universal Scalping Deck Method

- Large oversize scalped to jaw crusher. No glutting with undersize. Result: More capacity, less jaw wear, less h.p. required.
- Rolls receive only material over finish (lower) deck—no large rocks or slabs. Result: Less roll shell wear and lower h.p. required.
- Heavy top (scalping) deck wire handles large rocks—protects finishing deck. Result: All of screening area utilized fully, longer screen wire life.
- Screen operates counterflow (uphill) against material. Result: Better gradation and higher capacity—screenable material not carried over to crushers.

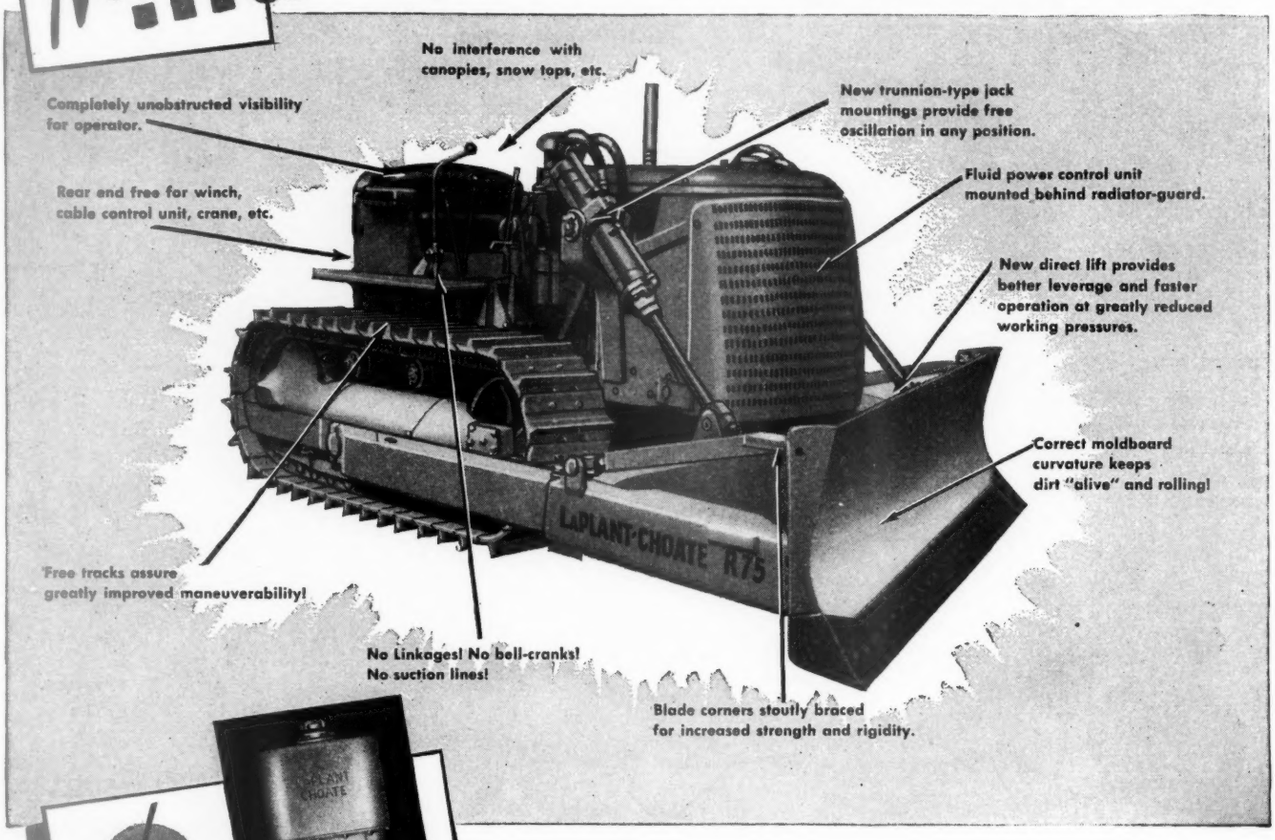
The Scalping Deck Screening Method is only one of the many superior features of Universal's better engineered plants. Send for bulletins detailing other distinct features.

UNIVERSAL ENGINEERING CORP.
619 C Avenue West, Cedar Rapids, Iowa

FOR FORTY YEARS
UNIVERSAL
ROCK AND GRAVEL CRUSHING AND SCREENING PLANTS
ASPHALT PLANTS · SPREADEROLLERS

NOW! ...a hydraulic dozer

with all the speed and simplicity of a cable machine!


No interference with canopies, snow tops, etc.
Completely unobstructed visibility for operator.
New trunnion-type jack mountings provide free oscillation in any position.
Rear end free for winch, cable control unit, crane, etc.
Fluid power control unit mounted behind radiator-guard.
New direct lift provides better leverage and faster operation at greatly reduced working pressures.
Correct moldboard curvature keeps dirt "alive" and rolling!
Free tracks assure greatly improved maneuverability!
No Linkages! No bell-cranks! No suction lines!
Blade corners stoutly braced for increased strength and rigidity.
LaPLANT-CHOATE R75

PLUS

LaPLANT-CHOATE'S FAMOUS

"fluid power control"

Pump, valve and oil reservoir are all combined into a single compact unit that mounts on the front of the tractor behind the radiator guard. This new "closed system" design completely eliminates long suction lines, reduces the hazard of leaks and assures greatly increased speed and efficiency. In addition, the entire unit is skillfully engineered and precision built for utmost simplicity, easy servicing, and long, trouble-free operation at lowest possible cost.

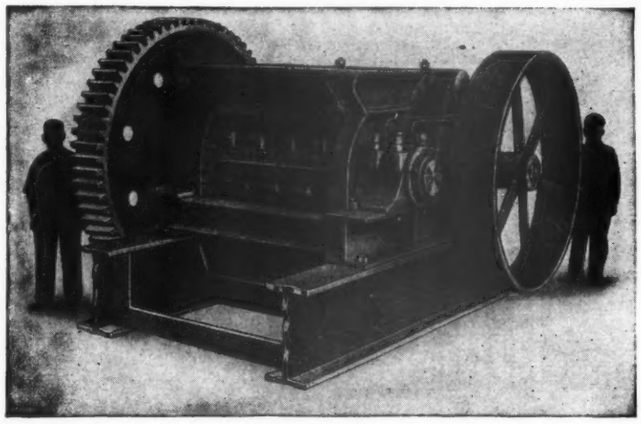
Here at last is a dozer that gives you all the advantages of hydraulic operation—powerful "down pressure" and positive blade control — *plus* new dependability, simplicity and fast blade action that will compare favorably with any cable dozer you've ever used. Developed for war and thoroughly proved under tough combat conditions, this new LaPlant-Choate machine has already been hailed as the greatest dozer advancement in over a decade. Moreover, it can be obtained with either straight or angling blade for "Caterpillar" D-8 and D-7 tractors, while other LaPlant-Choate hydraulic models are available for the smaller D-6, D-4 and D-2 sizes. See your LaPlant-Choate distributor today for complete details. LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa; San Leandro, Calif.

LaPLANT-CHOATE

Engineered Earthmoving

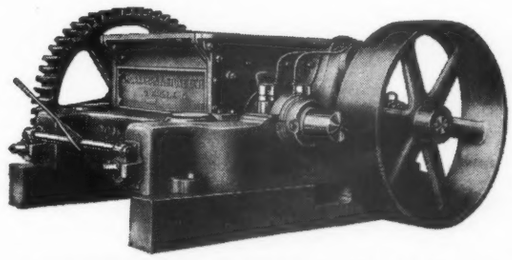
lowest possible cost per yard

A DOZEN GOOD REASONS
FOR CHOOSING
McLANAHAN
SINGLE ROLL
ROCK CRUSHERS



THE ROCKMASTER AUTOMATIC STEELSTRUT TOGGLE PRIMARY CRUSHER— REMARKABLE POWER AT LOW COST

1. All Steel Constructed 2. Cast Steel Gears 3. Automatic Steelstrut Toggle for Tramp Iron Protection 4. Chilled Alloy Iron or Steel, Interchangeable and Reversible Crushing Plate Liners 5. Hard Surfaced Steel Segment Rolls Easily Replaced Without Dismantling Machine 6. Takes Choke Feed. 7. Dry, Muddy, Wet or Frozen Material Never Packs 8. Lowest Proportion of Flats and Dust Produced 9. Slowest Speed of Moving Crushing Elements 10. Greatest Crushing *Range* With Opening Easily Adjustable 11. Takes Large Primary Sizes 12. Low First Cost—Low Power Cost—Minimum Repair and Upkeep Costs.



THE STEELSTRUT SLEDGE-WEDGE CRUSHER HIGHEST TON-PER-DOLLAR VALUE!

Modernize your present plant with modern, dependable, low cost McLanahan equipment. Write for descriptive Bulletins today.

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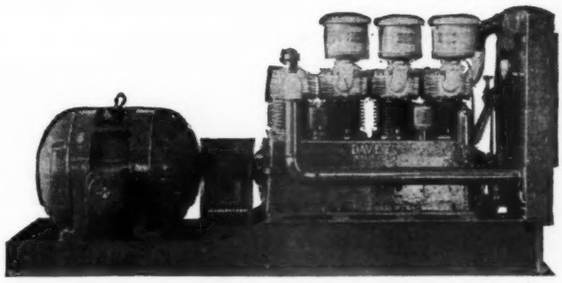
Pit, Mine and Quarry Equipment Headquarters
Since 1835
HOLLIDAYSBURG, PENNSYLVANIA

CHECK IT BY ANY TEST - -
DAVEY
AIR ARISTOCRAT

Our invitation to subject the Davey Compressor to the acid test of comparison is backed by the fact that it will deliver its rated output over a longer period of time than any other compressor, that its long-run cost is less.

Davey guaranteed-for-life valves are just one of the many reasons for the superiority of Davey Compressors. Davey conservative-speed operation is another big factor adding to its famous economy and long, trouble-free service. Add other Davey engineering features such as welded steel frame, aluminum alloy cylinder heads and automotive-type steering and you can readily see why we invite product comparison.



THE DAVEY INDUSTRIAL COMPRESSOR

The Davey Industrial Compressor is the quality leader among stationary air compressors because of the same exclusive Davey engineering features found in the trailer-mounted Air Aristocrat. For those tough pit and quarry jobs where maximum efficiency depends on a maximum air supply twenty-four hours a day, year after year, the Davey Industrial Compressor has no equal in sustained top performance, minimum maintenance and long-run economy.

★

Write for Catalog E-172, which illustrates and describes the complete line of Davey performance-engineered Air Aristocrat Compressors, Auto-Air Compressors, Industrial Compressors, Heavy-Duty Truck Power Take-Offs and Pneumatic Saws, plus valuable pneumatic engineering data.

D-945-20B

DAVEY *Compressor Co.*
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DEALERS IN PRINCIPAL CITIES

A Complete Meckum Designed and Built Dredge
Using the Meckum Steel Sectional Dredge Hull

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complete hydraulic

DREDGES

"ENGINEERED TO YOUR NEEDS"

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WE HAVE WHATEVER YOU NEED FOR YOUR DREDGE

Dredge Pumps
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DREDGING EQUIPMENT
53 West Jackson Blvd., Chicago 4, Illinois

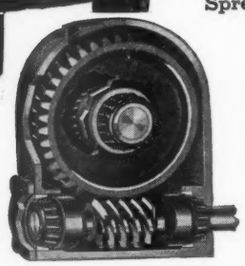
FOR PERFECT SPREADS USE A BAUGHMAN

The machine that made LIME popular!

Patented and Patents Pending.

View of a 6½ ton load in a 11-foot body.

View of our heavy, cut steel and bronze, 15 to 1, Gear Reduction. All gears are straddle mounted between Timken tapered roller bearings, sealed against dirt and running in a bath of oil. Simple, efficient, trouble-free — will give years of service.



BAUGHMAN ALWAYS SETS THE PACE!

Here is the all-around machine you have been waiting for — put it on your truck and use it the "whole year 'round." Spreading lime is only one of the many jobs this model will do!

MODEL K Wide Throat Drag Chain Type

Steel Body and Undercarriage. Capacities, 5 to 15 tons. Made in 9, 11, 13, 15 and 17 lengths — and 19, 21, 23 and 25 foot lengths with sideboards.

Handles wet or dry lime. Timken straddle mounted bearings, ball and roller bearings throughout. Only two oil-sealed cases and 1 short roller chain drive. Automatic chain feed regulator. Automatic endgates — large endgate for fast dumping. New style automatic drag chain tightener with anti-wrap chain stop. Only 1 patented distributor used. Spreads from 35 to 45 feet depending upon truck speed.

Other Baughman "Hi-Speed" Equipment

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Model N, Dump Body Lime Spreader
Model P, Phosphate Spreader
Motor or Farm Tractor Drive Spreader
Model F, Flat Bed Type Spreader
Model J, Transfer Unloader or Dump
Model L, Car Unloader
Model M, Car Unloader

Ask for recommendations—we have a reliable distributor near you.

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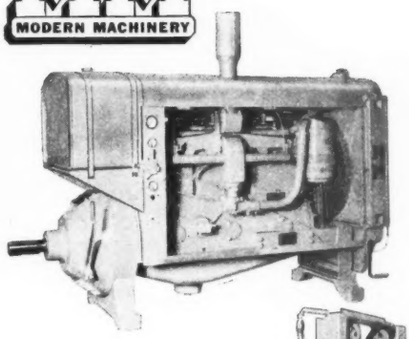
MINNEAPOLIS-MOLINE
MM
MODERN MACHINERY



Eliminate Loss of Time . . . WITH MM INDUSTRIAL POWER

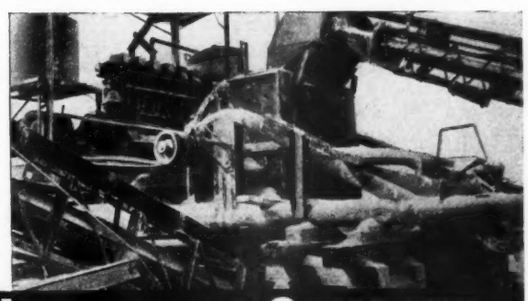
MM Power Units driving conveyers, compressors, crushers, generators, pumps, fans, blowers, and hoists, and MM Industrial Tractors equipped with bulldozers or loaders for stripping and loading provide steady, dependable performance and low operating cost per hour, per day, and per ton of material handled.

Breakdowns are mighty costly . . . meaning idle hands, reduced production, higher production costs. That's why in many fields where operation must be steady to be profitable, engineers select MM Industrial Power. MM Power Units are leaders in the oil field, where operations are 24 hours per day every day in the year. They are built to take it . . . develop maximum power with slow engine speeds, designed throughout with an extra measure of safety for long life, low cost operation. Offered in 7 sizes from 20 to 220 H. P., equipped to burn gasoline, distillate, natural gas or butane fuels.

MM Industrial Tractors have been developed for a wide variety of industrial operations . . . for heavy drawbar work as well as for use with loaders, lifts, snow plows, bulldozers, and many other mounted attachments. Offered in 3 sizes . . . featuring extra heavy front axle and tire equipment, heavy cast wheels front and rear, and special steering gear to permit easy steering under heavy loads. Front power take-off drive for hydraulic or mechanical lifts permits operation of mounted attachments independent of the tractor transmission.

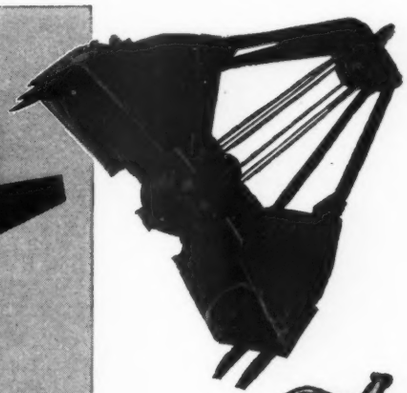
For dependable heavy duty Power Units or Industrial Tractors, look to MM.

Picture at Right
BUILT TO TAKE IT . . . MM Model HUA 6-cylinder Power Unit driving a crusher.



MINNEAPOLIS-MOLINE POWER IMPLEMENT COMPANY
MINNEAPOLIS 1, MINNESOTA, U. S. A.

First to feature Welded Steel Construction
WELLMAN
Williams Type **BUCKETS**



Bucket users know that welded steel construction means longer service at lower cost. Wellman originated this finer type of bucket construction! A type for every service: Multiple Rope, Power Arm, Dragline, Power Wheel, Special Service; ⅜ to 16½ yd. capacity.

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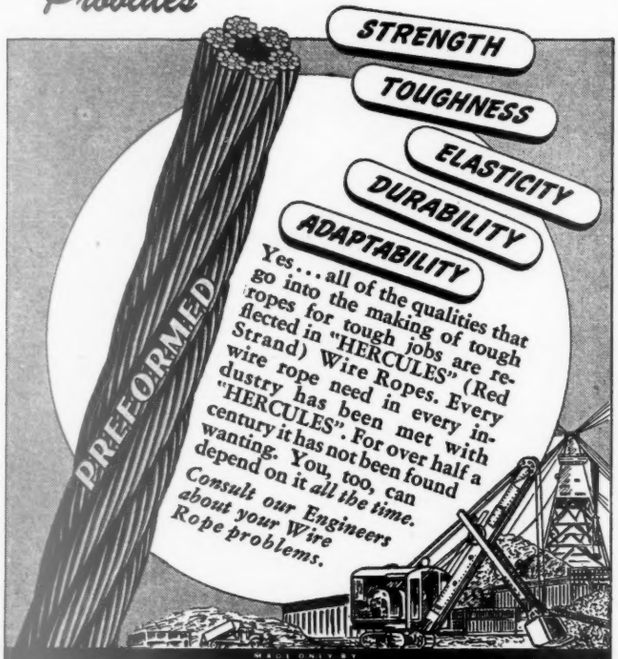
"HERCULES" (Red Strand) WIRE ROPE

Provides



Yes . . . all of the qualities that go into the making of tough ropes for tough jobs are reflected in "HERCULES" (Red Strand) Wire Ropes. Every wire rope need in every industry has been met with "HERCULES". For over half a century it has not been found wanting. You, too, can depend on it *all the time.*

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IMPACT BREAKERS
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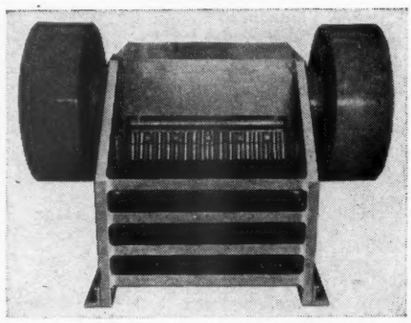
CONVEYORS
LOADERS

IN PROFITABLE ROCK REDUCTION

Territory Open for Responsible Distributors



EAGLE Jaw Crusher. Capacities to 1500 tons per day.

EAGLE JAW CRUSHERS are durable and rugged . . . show definite economies in power and upkeep requirements. Reversible jaws and cheek plates give double service.

EAGLE JAW CRUSHERS are available in capacities up to 1500 tons per day . . . are the standard rock reduction machines in modern plants.

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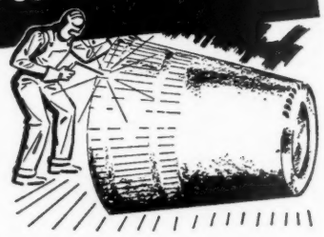

At last — a simpler, surer way of buying hard-surfacing electrodes. A new way that ends confusion and guesswork.

P&H Harcote, a famous name in hard-surfacing electrodes—has now been redesigned in a series of four new electrodes for Rockwell C hardnesses of 20, 35, 45 and 55. If crusher jaws require a hardness of 45 — you order and use Harcote 45. It's that easy!

Get the facts today. See your P&H representative or write for information. P&H also makes electrodes for every other welding requirement.

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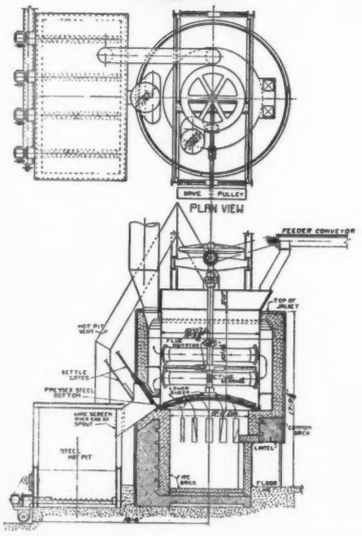

SIZE
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HIGH
Thermal Efficiency

STURDY
Agitating mechanism

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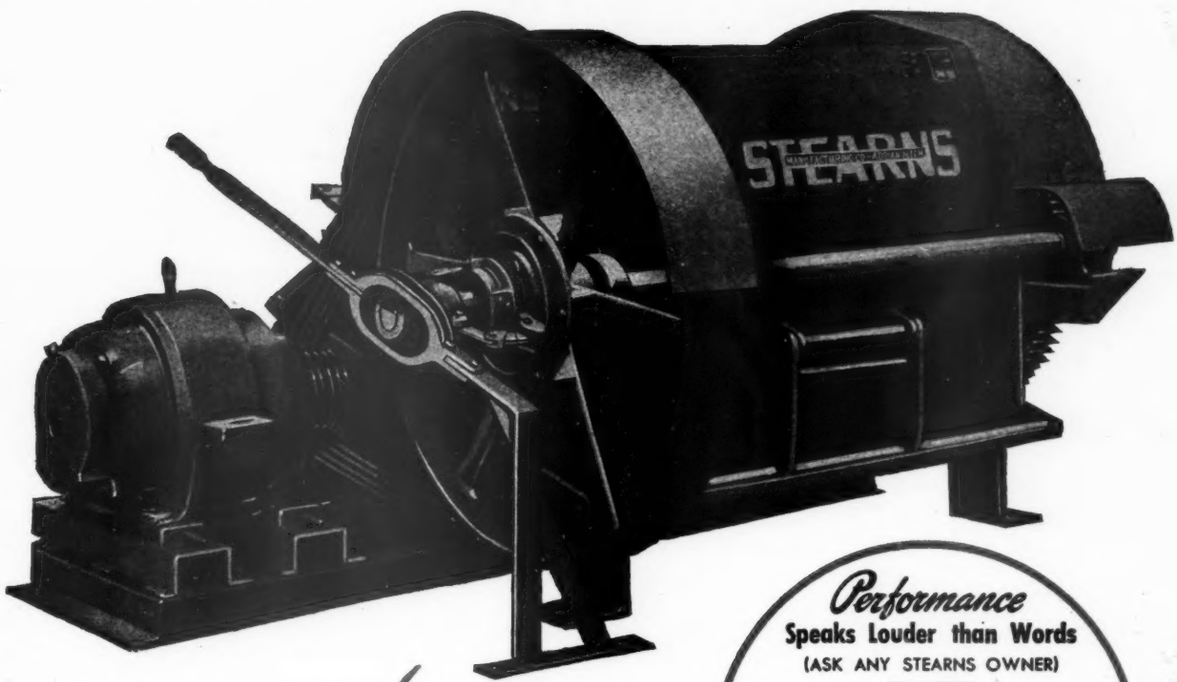
Consult EHRSAM on special problems in material handling and processing. EHRSAM Crushers, Screens, Mixers, Feeders, Hair and Fibre Pickers, Power and Transmission Machinery, and Elevating and Conveying Equipment for every purpose.

THE J. B. EHRSAM & SONS MFG. COMPANY
ENTERPRISE, KANSAS

April, 1946

The CONCRETE MANUFACTURER

A Special Section of...



Before buying a Mixer check these STEARNS Advantages

▶ ***Lowest charging height:*** saves time and fatigue✓ ***Lowest Maintenance:*** wear-resisting, removable, quickly shifted liner bars and adjustable "Sterloy" mixing blades reduce maintenance to a minimum✓ ***Discharge door*** opens easily, locks tight, won't leak✓ ***Conveniently located*** door control saves time, waste motion✓ ***Bearings:*** Self-aligning, anti-friction, dustproof✓ ***Drums of steel plate*** welded to heavy heads assure long life.✓

▶ ***When you✓ and double✓✓*** you'll find that Stearns machines do a faster, better job of mixing for less money. They are supplied in five capacities—12, 18, 28, 42 and 50 cu. ft. with pulley, V-belt or Gear-head motor drive. Larger sizes to order.

New Mixer Folder illustrating and describing these machines will be sent upon request.

Performance
Speaks Louder than Words
(ASK ANY STEARNS OWNER)

A Few of Hundreds:

CINDER CONCRETE PRODUCTS CO.
Denver, Colorado
Three Stearns Mixers

CONCRETE PRODUCTS COMPANY
Jackson, Tenn.
Two Stearns Mixers

CHANDLER MATERIALS
Tulsa, Oklahoma
Two Stearns Mixers

STEARNS Machines are time-tested, not hurriedly built to meet the present unusual demand.

STEARNS
GENE OLSEN, PRESIDENT

Designers and Manufacturers of Vibration and Tamp-Type Blockmakers . . . Mixers . . . Skip-Loaders . . . Yardhoists

Bubbles in Concrete

Improve Its Quality At No Extra Cost

Better Concrete: By creating billions of properly distributed microscopic air cells in the concrete mix, Atlas Duraplastic air-entraining cement makes the concrete more workable, more plastic, more cohesive and more uniform.

More Durable Concrete: Because of the extra plasticity imparted by the billions of tiny air bubbles, Duraplastic cement requires less mixing water for a given slump. This reduces segregation and bleeding, fortifies the concrete against the effects of freezing and thawing weather, and renders paving concrete highly resistant to the scaling action of de-icing salts.

No Extra Cost: Duraplastic cement calls for no additional materials—merely the same care and good workmanship regularly employed. It produces concrete that spreads, screeds and finishes easily. It complies with ASTM specifications, sells at the same price as regular cement, and makes better concrete at no extra cost.

Details about Duraplastic cement are summarized in a pamphlet sent on request. Write to Universal Atlas Cement Company (United States Steel Corporation Subsidiary), Chrysler Building, New York 17, N. Y.

OFFICES: New York, Chicago, Albany, Boston, Philadelphia, Pittsburgh, Cleveland, St. Louis, Minneapolis, Duluth, Kansas City, Des Moines, Birmingham, Waco.

PQ-D-52

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AIR-ENTRAINING PORTLAND CEMENT

A UNIVERSAL ATLAS PRODUCT

SUNDAY EVENINGS—*American Broadcasting Company (ABC) Network—U. S. Steel's "The Theatre Guild on the Air"*

The CONCRETE MANUFACTURER

APRIL, 1946

Vol. 9 No. 10

A MAGAZINE DEVOTED TO PRODUCTION OF CONCRETE PRODUCTS AND READY - MIXED CONCRETE

CCA

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Master Builders Co. Retains Hornibrook To Assist Scripture

F. B. Hornibrook

F. B. Hornibrook, nationally known authority on concrete and concreting materials, has been appointed assistant director of research of the Master Builders Co., Cleveland, according to an announcement recently made by the management.

On the staff of the National Bureau of Standards since 1930, Mr. Hornibrook was assistant to the chief of the Cement and Concreting Materials Section for the past five years. Research projects under his direction have included freezing and thawing studies of concrete, and materials and methods of application of chemical floor hardeners. Mr. Hornibrook has served such agencies as the Repairs and Utilities Branch of the U. S. Engineers, the Maritime Commission and the Federal Trade Commission.

Working under the direction of Dr. E. W. Scripture, Jr., director of Research of the Master Builders Company, Mr. Hornibrook will head the research laboratory and supervise research, control and field service.

Re-elect Olsen President Of Indiana Limestone Co.

Eugene F. Olsen, president of the Stearns Manufacturing Co., Inc., Adrian, Mich., was re-elected president of the Indiana Limestone Co. at Bedford, Ind. The company's newly-elected directors are W. G. Riley, New York City; D. W. Hayden, Baltimore; Charles Penn, Washington, D.C.; and Abraham Watner, Baltimore. They will assume their duties on August 1.

Mr. Olsen and the present board of directors were appointed on June 9, 1945, by Judge R. C. Baltzell of Indianapolis when the reorganization of the corporation was approved.

What do you want to know about the ready-mixed concrete industry or about concrete blocks, pipes, etc.? The Concrete Industries Yearbook can probably tell you.

Darby Accepts Post with Wallace Concrete Pipe Co.

J. P. Darby of Columbia, S.C., has accepted a position as sales manager for the Wallace Concrete Pipe Co. of that city. Mr. Darby was associated with the Carolina Concrete Pipe Co. of Columbia for the last six years.

Evelyn Janke Bouet Wins N.C.M.A. Recognition

Evelyn J. Bouet

Mrs. Evelyn Janke Bouet was recently honored by the executive committee of the National Concrete Masonry Association for her efficient handling of secretarial duties at the headquarters office when she was promoted to the position of assistant secretary. Miss Janke, as she is known to most association members, has been in charge of many registrations at N.C.M.A. conventions.

Coming Events

April 11-13, 1946—Chicago. Annual meeting, American Concrete Pipe Association, Edgewater Beach Hotel.

June 28, 1946—Buffalo. Annual meeting, American Society for Testing Materials and exhibit of testing apparatus and related equipment.

October 7, 1946—Chicago. 34th National Safety Congress and Exposition, Stevens Hotel.

Develop Quake-Proof Design Data in Pacific Coast Concrete Masonry Tests

anchor ON THE SPOT report

ORDINARY masonry construction has been restricted on the Pacific Coast in recent years under building code provisions designed to provide adequate earthquake resistance. The Uniform Building Code requirements for the design of masonry structures specifying steel reinforcing for resistance to lateral forces have, however, been rather difficult of interpretation.

Following a series of conferences between concrete-products manufacturers, building officials, structural engineers, federal agencies, and other interested groups, it was decided last year to undertake a research test program to develop basic design data for hollow concrete masonry that would supply a check on existing methods and requirements and indicate steps toward improvement and simplification. As a result, a cooperative test program was undertaken late in 1945 covering a series of tests of wall panels in flexure, of wall panels in "racking," or shear, and of core beams in flexure.

The test specimens were erected in Los Angeles and were carefully constructed of units and other materials that were considered representative of products readily available and on the market. The tests were conducted under the general supervision of Prof. Frederick J. Converse of the California Institute of Technology, in cooperation with the Portland Cement Association and the Southern California Concrete Masonry Association, and were observed by representatives of the Research Committee of the Pacific Coast Building Officials Conference, which provided the information for this article. Records of the entire program were carefully compiled by the Smith-Emery Company testing laboratories.

The wall panels were designed and constructed to determine the strength of assemblies having vertical steel reinforcing placed at varying intervals and to study the effect on shear of intermediate horizontal reinforcement. The core beams were built to study the effect of varying the position of the reinforcing bars as well as to correlate the strength of individual members with that of the panels. All the specimens were tested on a vertical span of 8 feet 4 inches, lateral load being applied at the quarter points for flexure.

A total of 21 wall panels and 12 core beams were tested in flexure by supporting them at the top and bottom and applying lateral load. Tests in shear, parallel to the wall, were undertaken on nine wall sections. The vertical reinforcing was placed after the wall panels were laid to full height, single ½-inch round steel bars being surrounded completely by grout poured in from the top. The panels were tied at both top and bottom by horizontal rein-

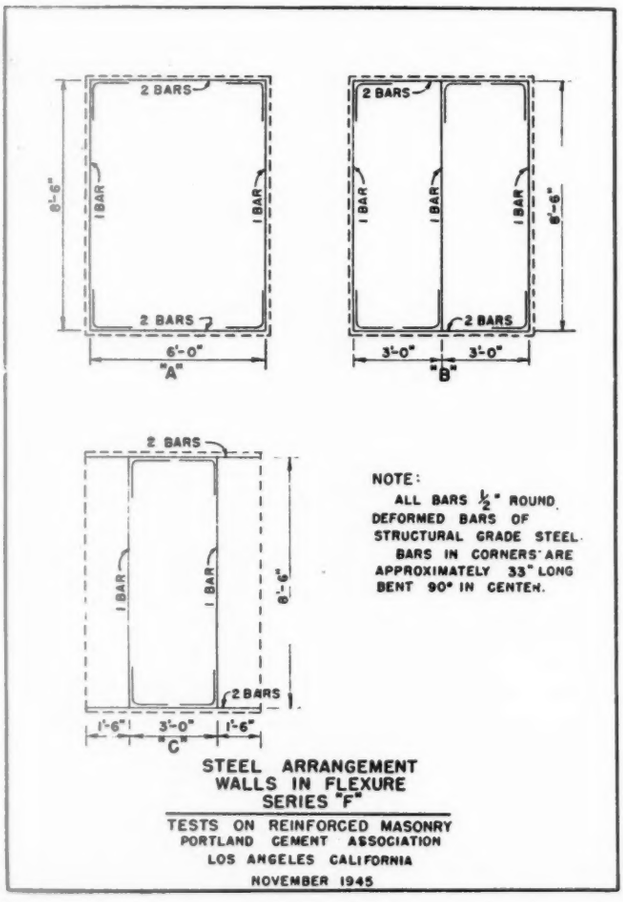


Fig. 1

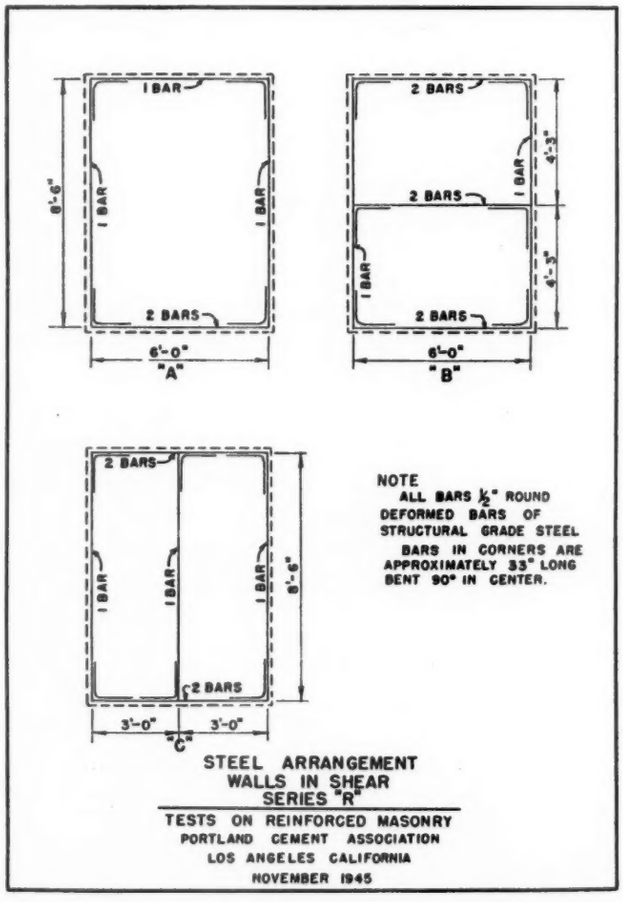


Fig. 2

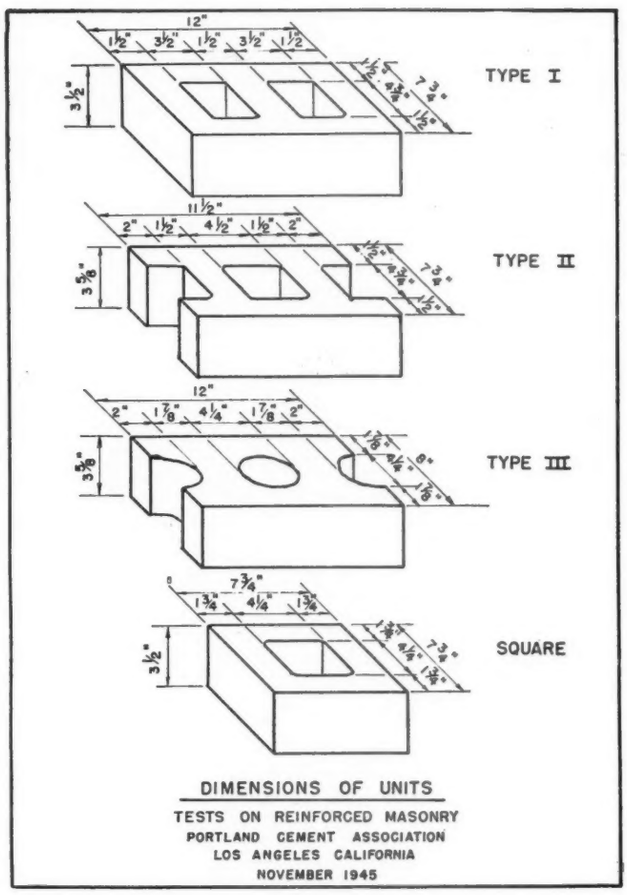


Fig. 3

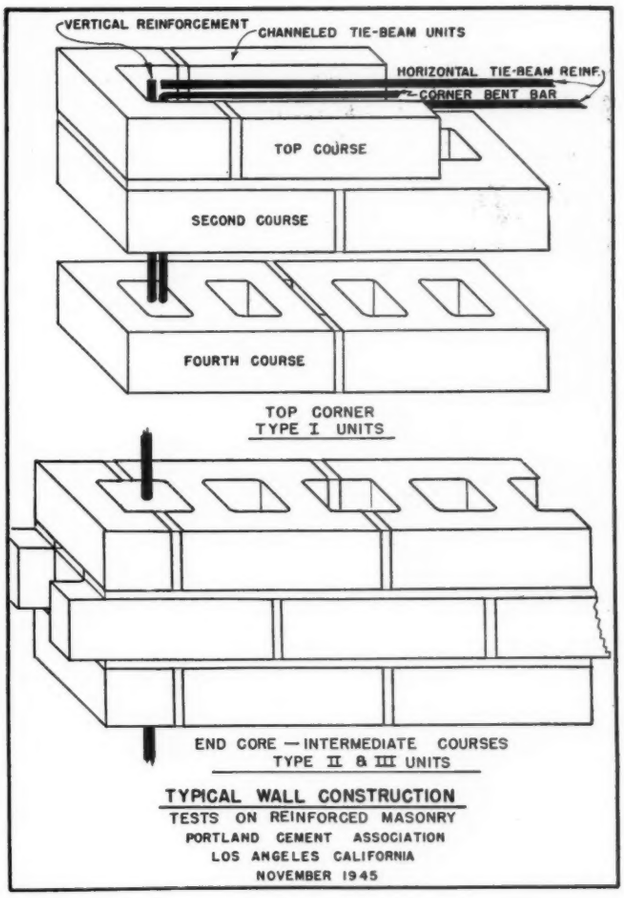


Fig. 4

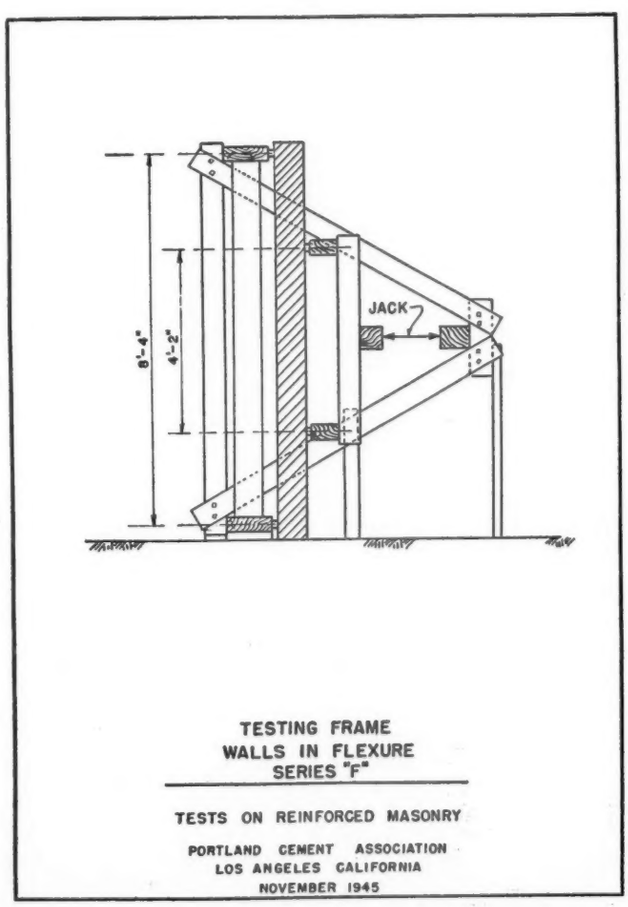


Fig. 5

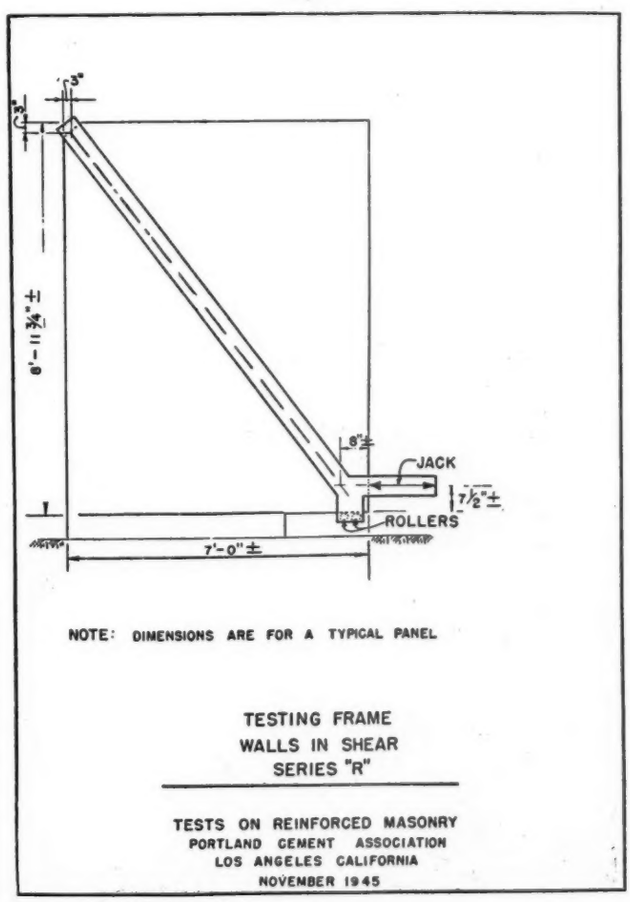
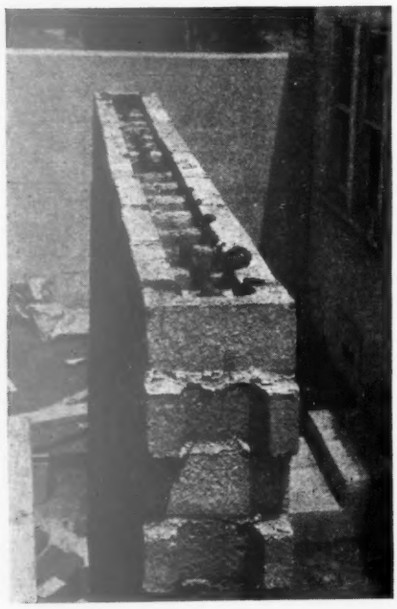


Fig. 6

Detail of wall in flexure test, showing loading frame, jack, beam and deflection gages.



Top of completed wall, showing channel course with bent bars connecting vertical and horizontal beams. Below: A beam after test in flexure.

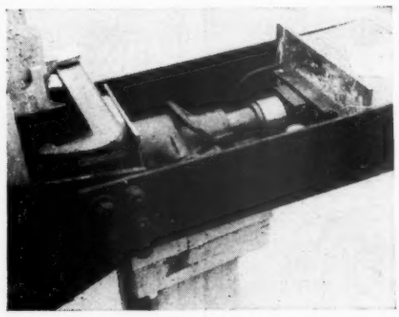
forcing consisting of two ½-inch round bars encased in mortar on one course of blocks. In one group of wall panels tested in racking, or shear, an intermediate horizontal tie was also used.

Under test, the walls behaved quite consistently in accordance with the known principles of the design of reinforced concrete, the limiting strength being dependent upon the amount of reinforcing used.

Walls in Flexure In the tests on wall panels for flexure, 21 panels approximately 9 feet high (18 were 8 inches thick and three were 6 inches in thickness) were tested. The arrangement of reinforcing bars is shown in Figure 1 and the shapes and dimensions of typical units in Figure 3. Walls were constructed as indicated in Figure 4. Tests were made 28 to 32 days after grouting, the wooden testing frame (Figure 5) supporting the wall at top and bottom, the load being applied at quarter points of the height by means of a hydraulic jack. A calibrated beam gage measured the load and deflection was determined by a dial gage.

The strength of the walls varied directly with the amount of reinforcing and with wall thickness and was independent of wall length within the range covered by the

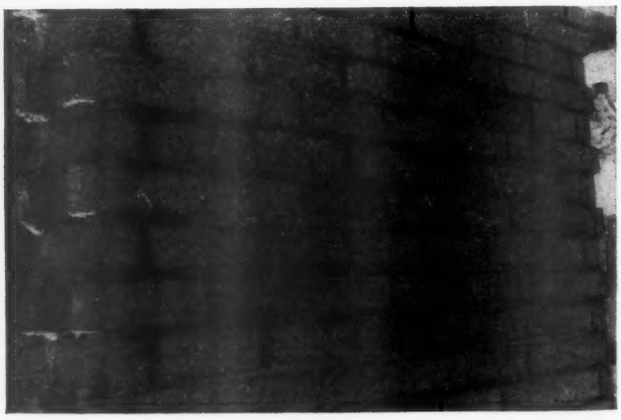
(*Continued on page* 130)



Jack and beam gage assembled in yoke for application of shear load.

Typical failure of shear panel having intermediate reinforcement and also end vertical beams.

Typical shear, or "racking" failure of a panel having vertical beams at ends only. Below: Grouted wall containing three vertical beams at ends and center.



26th Annual N.C.M.A. Convention Features Plant Design and Operation

another ON THE SPOT report

THE 26th Annual Convention of the National Concrete Masonry Association, held March 12 to 14 at the Sherman Hotel, Chicago, brought together the largest assemblage of concrete block manufacturers in several years. For the first time in several years also a machinery exhibit was held and this, though small in comparison to earlier shows, proved to be a major attraction. The meetings were well attended and, because of the intelligent selection of subjects for papers and discussions, provided for those present answers to many of the most pressing problems confronting the industry.

Separate sessions were held on plant design and plant operation, continuing the discussions begun at the special meeting held a few months earlier. Anyone attending these meetings could have no doubt that the concrete block industry has left the "back yard" stage far behind it and that the future of the industry lies in the hands of those who can make a uniformly high-grade block with the most modern methods and equipment. The shortage of labor during the war apparently forced upon many producers the realization that manual methods are too costly and expensive. As a result many plants already have been mechanized to the point where blocks will soon be delivered without having been touched by the human hand in any stage of manufacture or handling.

At another session modern advertising and merchandising methods were described before an overflow audience which participated actively in the discussion. It is significant of the development of the industry that these subjects are of such interest at a time when practically every manufacturer is several months behind his orders. This progressive spirit was emphasized in a luncheon speech by John A. Ruhling, manager of the Housing & Cement Products Bureau of the Portland Cement Association. Mr. Ruhling outlined the ambitious program being undertaken by his department in support of the promotion of concrete masonry units. His speech contained so much of vital importance to the industry that it will be reprinted in full in the May issue of PIT AND QUARRY.

Deane Lynde, Cinder Products Co., Denver, newly elected president of the N.C.M.A., and Evelyn Janke, assistant secretary.

New Officers The new officers of the association are: Deane Lynde (Cinder Products Co., Denver), president; Ed Weese (Carbon Concrete Brick Co., Youngstown), first vice president; Paul E. Bohm (Concrete Products Corp., South Bend), second vice president; Philip Paolella (Plasticrete Corp., Hamden, Conn.), third vice president; Henry Buchholz (Chicago Insulcrete Co., Franklin Park, Ill.), secretary and treasurer.

Cinder Aggregates The meeting of the Cinder Aggregate Division, Tuesday morning, was presided over by Philip Paolella, chairman. The first speaker, G. G. Seaton, Portland Cement Association, described the methods developed for the testing of cinders and cinder blocks. The blocks are laid up in piers and painted white to accentuate any staining. After nine months the blocks are checked and classed in three grades instead of the five formerly used. These are: slightly, moderately, and badly stained. Such blocks, he said, are classed as satisfactory, doubtful, and unsatisfactory, respectively. It has been found, said Mr. Seaton, that serious stains show up within a few months after exposure, and that light stained

Below, left to right: G. T. Morris, Concrete Products Co., Anniston, Ala.; R. M. Whitney and J. L. Van Cara, Automatic Transportation Co., Chicago; and H. T. Pointer, Builders' Supply Co., Cooksville, Tenn.

Below, left to right: J. W. Kennedy, advertising manager, Barret-Cravens Company, Chicago; M. W. Zahn and F. C. Wallman, both of E. G. Artz, Inc., Milwaukee; and E. J. Heimer, president of Barret-Cravens.

blocks seldom pop out. Tests, he said, show that the amount of staining of a block is an accurate guide to the quality of the cinders in it, and visual inspection is a safe and accurate guide.

Mr. Seaton also described the results of moist storage on raw cinders. Four weeks' storage reduced staining 72 per cent., eight weeks 75 per cent., and 12 weeks 88 per cent. This method was described as the cheapest and will render all but the very worst cinders usable.

The milk-of-lime method of improving cinders, said Mr. Seaton, is more expensive but can be used to salvage cinders which can not be made usable by the moist method. With this method staining was reduced 93 per cent. in four weeks, and 100 per cent. in eight weeks. With either method the best results are obtained if the cinders are crushed before processing.

G. H. Westby, P.C.A., then described the apparatus developed for making stain tests of cinder samples. This consists of a metal tank with a water reservoir to keep a constant level in the tank. Cinder samples are tied up in filter paper and placed in the tank which contains water heated to the boiling point. He also cautioned that, for best results, the dust must first be removed from the cinder samples. The P.C.A., said Mr. Westby, will gladly send a booklet describing the construction of this inexpensive device to anyone interested. R. E. Copeland of the P.C.A. also participated in this discussion.

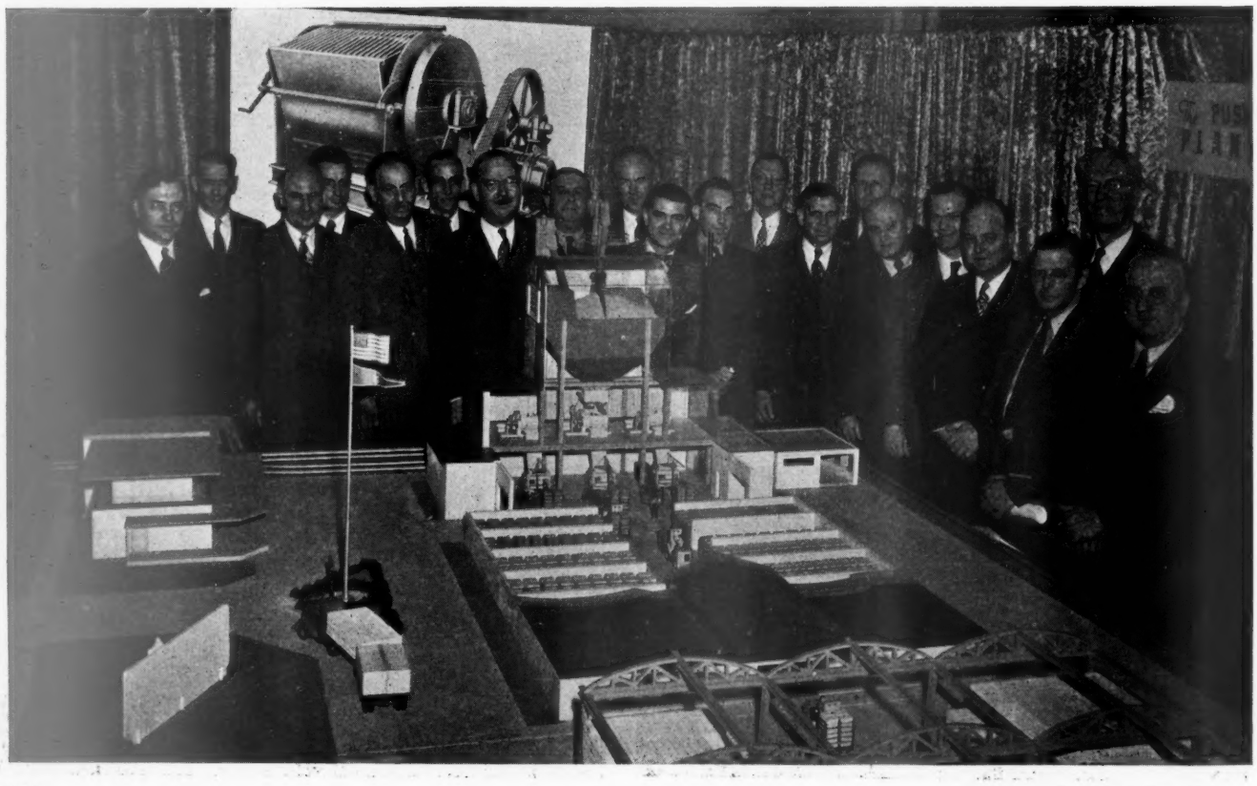
Celocrete The drying of blocks was one of the subjects most discussed at the meeting of the Celocrete Aggregate Division of which Jay C. Ehle was chairman. The use of colors, texture control, and the need for adequate boilers also received attention.

Waylite-Superock On Tuesday morning, the Waylite-Superock Aggregate Division held a meeting. Paul M. Woodworth, at whom most questions were directed, stated that the aggregate is shipped in hopper cars in two sizes, coarse and fine, and must be mixed at the plant as it is not advisable to mix before shipment.

Aggregate mixes recommended for satisfactory block production ranged from 60 per cent. fine and 40 per cent. coarse to a 50-50 mix. It was advised that if sand is used, it should be either bank or lake sand passing a Number 16 mesh. Not less than a 50-cubic-foot mixer is recommended with a 12-15 minute mixing cycle.

In discussing mixing procedure, the following method was suggested: mix the fine aggregate with half the mix water for 1½ minutes, then add ¼ of total mix water; when this is done, add the balance of the water and the coarse aggregate and mix for 4 or 5 minutes.

The next general topic of discussion was curing room design and techniques. It was generally accepted that 120 degrees F. was the minimum temperature for curing and an optimum temperature could not be established. The location of making temperature measurements is not too critical according to those reporting though it is customary to use the 3-foot level for measurement. Usually about 3 hours are required to bring the block temperature to the maximum curing temperature. Eighty per cent. of the heat loss is in bringing the blocks up to temperature, and 20 per cent. heat loss is in radiation. A curing time of 10-12 hours was recommended. Before removing the blocks from the curing room, dry air should be circulated through the room for about 3 hours to dry the blocks before storing. A boiler of at least 10 hp., is necessary for curing 1000 blocks per day.



Below, a group of Besser Mfg. Co. men at that company's exhibit. Left to right: E. C. Bobolts, vice-president and assistant general manager; James Rhodes, district manager, Detroit; Howard Davis, factory representative; Harry Bott, chief plant designer; Jack Franklin, district manager, New York; Wallace McKay, factory representative; Haakon Paulson, distribution manager; J. J. Staley, district manager, Philadelphia; David Wright, district manager, Phoenix; Clem Mason, factory representative; Harry Robinson, factory representative; F. W. Wehrum, district manager, Pittsburgh; J. W. Craighead, factory representative; Lou Galloway, assistant district manager, New York; W. L. Fuller, district manager, Washington; Erwin Hahn, export sales manager; Del Fox, general sales manager; Myron Hultmark, district manager, Chicago; J. H. Besser, president and general manager; and J. L. Sullivan, factory representative.

Above, left: J. H. Besser, president of Besser Mfg. Co., explains his company's animated scale model of a complete block plant to Mr. and Mrs. Ernest Swanson. Right, left to right: E. K. Geist; Harold Geist; Herbert F. Geist, president; Wm. G. Riley, superintendent; all of the Geist Coal & Supply Co., Cleveland.

Haydite W. R. Stanley of the American Aggregates Company, Kansas City, presided over the meeting of the Haydite aggregate division, with A. R. Waters of the Carter-Waters Company, Kansas City, and W. C. Smith of the Cooksville Company, Ltd., Toronto, Canada, representing the Haydite producers. Some 40 block makers who attended the meeting made it clear that the Haydite industry's number one problem so far as they were concerned was to increase production as quickly as possible.

Mr. Waters disclosed that his company has taken an option on a suitable deposit near Kansas City and will start building an entirely new high-capacity plant just as soon as zoning difficulty in connection with the property has been cleared up.

In connection with his company's operations Mr. Smith said that the chief difficulty at present is the lack of sufficient labor, as evidenced by the continued employment of about 240 German prisoners.

Mr. Smith mentioned briefly the use of Haydite in floors and slabs in some of the plant buildings in which work was carried on in connection with the development of the atomic bomb. In fractionating isotopes of Uranium 235, he said, Haydite was found to be one of the very few materials that could "stop" the Beta and Gamma rays released.

Luncheon At the association's general luncheon meeting, Frank T. Sheets, president of the Portland Cement Association, spoke briefly in praise of the industry's outstanding accomplishments. The principal speaker at the luncheon was John A. Ruhling, manager of the Housing and Cement Products Bureau of the P.C.A., who outlined his department's program in support of the promotion of concrete masonry construction.

Clarence E. Ehle, retiring president of the N.C.M.A., opened the first general session of the convention by giving a resumé of the association's history and he also expressed a desire to further increase the number of members.

Secretary's Report E. W. Dienhart, executive-secretary of the N.C.M.A., then said that the many government reports and regulations require attention and clarifying, and that many reports and bulletins issued by government agencies about the industry should be corrected or eliminated.

Below, left to right (seated): Jack Finfrock, Anchor Concrete Machinery Co., Columbus, O.; R. O. Davis, superintendent, Stearns Mfg. Co., Adrian, Mich.; T. W. Kline, E. B. Kelley Co., Philadelphia; and Hal Pembrook, C. J. Rahn Co. Standing, left to right: C. S. DeLamater, vice-president, and Forest M. Cook, assistant sales manager, Stearns Mfg. Co.; George Freel, Anchor Concrete Machinery Co., Columbus, O.; and Frank Oaks, Michigan Stearns representative.

The N.C.M.A.'s position with the Civilian Production Board was reported favorable, and special priority ratings have been issued to the industry to obtain the equipment needed to carry out a program which can cope with the construction demands.

The executive-secretary went on to advise veterans, and others, that to enter the industry on a "shoestring" was very hazardous as they stood a good chance on losing out.

In reply to the many requests received for information on how to start new plants, Mr. Dienhart said that he found it necessary and advisable to prepare a form letter of advice, not attempting to restrict or discourage anyone planning to enter the industry, but rather to point out facts to be considered beforehand.

For prospects with an optimistic outlook, the following points of advice were offered: Canvass marketing area around the proposed plant; employ an architect and engineer to design and build an efficient plant; obtain all possible machinery, manufacturing, and development data; for

a good product, have a testing laboratory and engineer; have sufficient capital available; join the N.C.M.A. in order to receive the benefit of the work done by the Association.

New Directors John L. Strandberg, president of the nominating committee, presented the names of 4 nominees for director who were accepted by the members and elected to office. The new directors are: Philip Paolella, Les Walb, Austin Crabbs and George J. Katterjohn. According to Mr. Strandberg, the nominating committee decided to increase the number of directors to 15 in view of increased membership in the Association. The three new directors elected are: W. Chester Smith to serve 3 years, J. C. Henry to serve 2 years, and C. D. Campbell to serve for 1 year.

E. W. Dienhart, executive secretary of N.C.M.A.

Plant Design The Wednesday morning session of the N.C.M.A. convention was devoted to plant design discussion with E. W. Dienhart, executive secretary, presiding. The first speaker introduced was Richard Carpenter, chief engineer of the Anchor Concrete Company of Buffalo, New York, who led the discussion on aggregate handling. Mr. Carpenter described the system designed to handle aggregate at his plant which has been expanded from 1 machine to 3 machines plus a casting plant. The railroad siding is some distance from the plant. To get the aggregate from the car hopper to the overhead bins, two inclined belt conveyors are used. A truck hopper is also installed just ahead of the car hopper thereby permitting either carload or truck delivery. The bins are high enough to provide gravity feed into the plant.

The next topic of discussion, on mezzanine and ground floor locations for mixers, was led by H. Filippi and Sam Paturzo. In describing the design of his 4-machine plant, Mr. Filippi stated that mezzanine location of the mixers was thought to be the most satisfactory under the circumstances involved.

Benjamin Wilk and R. S. Beale led the next discussion on batch and continuous mixers. Mr. Wilk said that, in tests conducted with comparable sized batch and continuous mixers, the products made by the latter type mixer gave more satisfactory test results; power cost and consumption was considerably less as a 5-hp. motor driving the continuous mixer was able to keep up with a large vibrator machine.

Mr. Beale, who employs a batch mixer with satisfactory results, stated he was in no position to make an authoritative comparison of the two mixers, but he did have one unanswered question regarding continuous mixers. He questioned the positive mix of lightweight aggregate in the mixer as compared to that in a batch mixer.

The next discussion, on the construction of curing rooms and curing room doors, was led by Harvey Black and Philip Paolella. Mr. Black and Mr. Paolella spoke on the proposed designs to be used in the construction of new curing rooms at their respective plants. Design principles are to be based on previous experience, engineering investigations, and the utilization of recently developed products which are applicable to curing room construction.

Price Control The final speaker at the Wednesday morning session was William L. Pringle of the Building Materials Price Branch of the O.P.A. In his address, Mr. Pringle explained the policies and procedures of the O.P.A. as applied to the concrete block industry. On the question of price relief, he advised that provision is made for relief under prescribed circumstances according to Maximum Price Regulation 592. Interpretation of this regulation was further explained by the speaker, and advice was offered on how individuals or groups of producers can make application for relief under this ruling. He went on to say that the O.P.A. believed that continued price controls were necessary, but should be and are supposed to be, flexible enough to cope with all situations. In closing, Mr. Pringle said he could not definitely say how long O.P.A. regulations would be in effect, but that when supply generally is in balance with current demand at ceiling prices, O.P.A. would be only too anxious to suspend price controls. He added that, probably some time before it arrives producers will know that the competitive law of supply and demand will require that prices remain approximately where they are at the time O.P.A. determines price control to be no longer necessary.

Plant Operation One of the best planned and most practical meetings of the kind ever held by the association, the plant operating session attracted a large audience. Cloyd Fellabaum told the group that his company has used covered storage for the past ten years and has found that it not only improved production, both in quantity and quality, but has resulted in vastly improved labor relations throughout the plant. The men report for work regardless of bad weather, he said, and as a result the plant has lost only 17 days of production since 1937 when storage areas were covered. In addition, Mr. Fellabaum thinks that block stored

Left to right: F. M. Kettenring, Graystone Concrete Products Co., Seattle; Walter Sherman, Best Block Co., Milwaukee; and Otto Buehner, Buehner Cinder Block Co., Salt Lake City.

in well-ventilated covered areas are far more likely to meet specifications than those stored in the open.

In the discussion of double-shift operation L. M. Upchurch of North Carolina said that his company designed and built a new plant last year with two-shift operations definitely in mind. Every effort was made to create conditions as nearly ideal as possible for the men on the second shift. Careful attention was given to the proper lighting of all work areas, including stock piles, curing rooms and storage yards.

According to Mr. Upchurch it is highly desirable to have a part of the aggregate stock pile under cover if a

double shift is to be worked. In their own case, he said, all aggregate handling equipment was selected with a view to making it wholly unnecessary to operate that portion of the plant on the second shift.

On the same subject John Strandberg expressed the opinion that proper treatment of labor is the heart of the production problem. His company has found that maintenance costs are no higher on the second shift if the men are properly trained for their work. According to Mr. Strandberg competition between the two crews in double shift operations has a favorable effect upon production, and he is of the opinion that his company makes more profit on the second shift than on the first, due to smaller overhead at night.

Joseph Nagy of Toledo and Herbert Geist of Cleveland led the discussion on low- and high-lift trucks. The former described his company's practice of cubing the blocks and loading them out with high-lift fork trucks. The truck operator does all the loading and, with the cubing method, 1,200 blocks can be loaded in 20 minutes, whereas formerly with hand loading it took four men 2½ hours.

Mr. Geist referred to lift trucks as the nervous system of the plant, and he described some of the many jobs performed by the Towmotor units used in his plant. Their practice, he said, is to set the racks on a 42-inch-high platform for loading block onto trucks and that so far they are not convinced that cubing would have any material advantage over this method.

C. L. Steward of the Portland Cement Association demonstrated to the meeting the methods used to determine the moisture content of concrete masonry units. Since the procedure was explained in considerable detail in the January issue of THE CONCRETE MANUFACTURER (page 165), it will not be repeated here.

The final general session of the convention on Thursday morning was presided over by E. W. Dienhart. The first item on the program was the showing of a movie of the block-handling methods of a member company.

P.C.A. Promotion W. G. Kaiser, manager of the Farm Bureau of the P.C.A., then outlined a basic program for insuring future business in the farm market.

One of the chief educational items prepared, said Mr. Kaiser, consists of colored sound movies of which eight are available for showings at schools, colleges, grange and civic meetings, and wherever farmers gather. One such movie just completed was shown to those present. In 20 minutes this movie, "Building With Block," showed and described how concrete block is being used in the construction of all types of farm buildings, houses, business buildings, etc., and for the improvement of existing structures. It also showed how the blocks are laid from the foundation up, including the placing of window frames, lintels, sills, jamb blocks, metal sash, ceiling joists, etc.

William Sterling, managing director of Kier & Cowder, Ltd., Glasgow, Scotland, and David Wright, Besser Mfg. Co., Phoenix.

Also included were descriptions for the mixing of mortar, provisions for waterproofing, drainage, and painting with portland cement paint.

This film serves to arouse interest in the use of concrete blocks but the P.C.A. goes further by providing strip film slides, also colored, which follow the same pattern as the movie but have text on them in place of the sound track. These are designed for teachers who wish to teach the subject in their shops. Colored slides are also provided for field representatives of the P.C.A. so that they can go into the schools and put over the subject with a prepared script. Mr. Kaiser closed by stating that producers can arrange to have the movies shown in their neighborhoods by contacting the nearest P.C.A. field office. Any of this material will also be sold at cost to any producer desiring it.

Merchandising Methods Merchandising methods of some leading producers of concrete blocks were next described. Among those participating were: Harry Wagner, Plasticrete Corp., Hamden, Conn.; Otto Buehner, Buehner Cinder Block Co., Salt Lake City; Harold Geist, Geist Coal & Supply Company, Cleveland; F. M. Kettenring, Graystone Concrete Products Co., Seattle; and Harold Spaight, Cedar Rapids Block Co., Cedar Rapids, Iowa. All stressed the need for even greater sales and educational effort than in the past and all emphasized the necessity of each manufacturer advertising not concrete block, but his trade name.

Mr. Buehner emphasized the fact that, although a good publicity job is being done, even greater efforts must be made. As an example he cited that concrete block is seldom even mentioned in the leading housing magazines while competitive materials get large amounts of publicity.

Mr. Kettenring briefly described the progress made in Seattle, a lumber city where concrete blocks were almost unknown 11 years ago. Now over 4,000,000 blocks are sold annually in that city of 500,000 population. His company does not send out separate circulars but provides a complete file of them which a prospect will not readily throw away. Three sales engineers are employed in spite of the fact that there is a backlog of three months' production. A planned advertising program and a professional consultant are a part of this very comprehensive program.

Mr. Wagner's company also employs an advertising specialist and supplies a complete file of literature. Among the more unusual items is a chart which an architect can use to trace through block layouts on his plans. An estimating sheet also simplifies the estimating problem.

Mr. Spaight believes that 100 per cent. coverage for the block industry can only be obtained by selling through building material dealers. This, he said, is the way competitive materials have gained such wide favor. Even where large jobs are sold direct the dealer in the territory is paid his commission by the company.

Mr. Geist particularly stressed the manner in which his company stresses the name of its block, Geistone. He also described the many types of advertising pieces sent out in what is probably one of the most thorough and intelligent jobs being done by any block manufacturer. Of particular interest is a price list with a map of that part of northwestern Ohio in which the company sells. This list tells any prospect at a glance what the blocks will cost him delivered.

Paul M. Woodworth closed the meeting with a review of A.S.T.M. specifications and several leading manufacturers led brief discussions on other subjects of current interest.

How Our Company Solved a Critical Labor Shortage Problem

By HAROLD GEIST

another P AND Q exclusive

"BLOCKS, and more blocks!" is the cry today of a building industry starved for materials. Not alone builders and owners, but officials of every municipality, of every state, of the Federal Government are calling on the block industry to meet the demand. The importance to which concrete blocks have sprung during the war years has created a tremendous obligation to those of us in the industry. It behooves us to meet the torrent of demand with a torrent of blocks.

Our shortages today are mostly mechanical. Manufacturers of block machines are months behind on orders. Most equipment is impossible to get in time to meet at least a part of the large orders for early Spring delivery. Too many manufacturers are finding too many reasons why they can't make more blocks right now. Some of these reasons are legitimate, but many of them don't have a basis that a little ingenuity won't overcome.

Out in Cleveland, the Geist Coal & Supply Company has one Besser Super-Vibrapac, yet with that single machine they made just slightly less than 3 million blocks (8- by 8- by 16-inch equivalents) in 1945. What's more, they made 2¼ million in 1944 and slightly under 2 million in 1943. This was in a city that, until V-J day was classified as a critical labor area, and where it was impossible to get any new mechanical equipment whatever during the war.

Cleveland, as did most metropolitan centers, grew tremendously during the war years. In 1942-43 the demand for blocks increased for Government war housing and industrial plants. The Geist company, pioneer manufacturer of blocks, was in the position of having to turn down as much—or more—business than it took.

Moving one section of lattice framework for the belt conveyor at the Geist Coal & Supply Company's yard. This job is one of many uses to which the high lift fork trucks are put. Extreme left, Charles Lamoureaux, plant engineer; on lift truck, William Riley, plant superintendent; second from right, Robert Geist, superintendent of maintenance.

Early in 1943 it was decided that something had to done to fill a greater tide of orders. They went through all the heart-breaking routine of trying to get additional equipment through the WPB channels but Uncle Sam said, and rightly too, a loud NO!

At that time the Geist plant was operating 10 hours a day, 6 days a week, having previously stepped up from the usual 40-hour week. The only solution to the production problem was to operate longer hours. The first step was to operate until 9 p.m. This decision was arrived at after lengthy discussions, and was based on the assumption that part-time employees would be available after their regular working hours and would be interested in working from about 6 p.m. until 9 p.m.

The original part-time crew was a combination mostly of friends and relatives of full-time employees. The word was passed to all employees that extra work was available, particularly to those who had sedentary work and would welcome outdoor work at good pay. A letter was enclosed in monthly statements to customers (the Geist company is also in the coal business and has a sizeable customer list) stating these same facts, and requesting customers to send THEIR friends or relatives, or come in themselves and work. Within 30 days far more applications were being turned down than were hired and, more important, the plant was operating efficiently until 10 p.m.

It was soon decided that it was as easy to operate until midnight as to

Left: Robert Geist, maintenance superintendent, and Harold Geist, sales manager. Right: Herbert F. Geist, president of the Geist Coal & Supply Co.

Left: High lift trucks place the racks of blocks on portable loading docks, from which the blocks are loaded directly to the truck. William Riley, superintendent, at left. Center: Harold Geist, sales manager, and William Riley. Right: Signs at plant site helped to atttract new full- and part-time workers.

10 p.m., and the plan was immediately put into effect. First, a group of full-time key men had their hours changed from the usual 7 a.m.-5 p.m. to 2 p.m.-midnight. Additional part-time men who were available during the morning hours were then employed. There was thus a group of full-time key men working from 7 to 5, assisted by part-time employees, and another group of key men working from 2 p.m. until midnight.

By this time a number of the part-time men were becoming proficient in the semi-skilled jobs that exist in the block plant. There were mixer men, off-bearing hoist men and lift-truck operators.

There was a constant training school in progress. Men were encouraged to try jobs other than the one they were performing. An extra air-hoist was set up in a corner of the plant on which men could practice its operation. A rack of cured blocks was kept next to the hoist and all practicing was done with this finished ware instead of the green product. After a few hours of practice with this device a man was given short periods of work at the Besser. There were two lift trucks in the plant, one of which was not in constant use. Men were encouraged to try their skill on this extra truck whenever it was not in use. They would move racks back and forth in the plant until they were sufficiently adept to handle it as a job.

There were mimeographed instruction sheets covering several of the jobs. These instruction sheets were issued only to men who requested them, and they would take them home, or read them over in a corner of the plant.

This school was in progress constantly and every effort was made to have men do the jobs which interested them most. Every beginner started on the block pile and from there went to the job which best fitted him. It was not long until all functions of the plant operated until midnight, or as late as was practicable. Coal deliveries and block deliveries were made, by special arrangement, at all hours. Raw materials for the manufacture of blocks were hauled at all hours. A number of machinists, welders and auto mechanics were discovered on the rolls of part-time men, and plant repairs, truck repairs, etc., were carried on more efficiently and easily than during the regular daylight hours. Skilled men were almost impossible to get during the day, but they were available in embarrassingly large numbers after nightfall. On the regular employee rolls of the Geist company today is their truck mechanic who came as a part-time worker in the summer of 1943.

The increase in skill of the part-time men helped to solve one of the major problems of this extended operation. With numbers of inexperienced people supervision was a matter of vital concern. With other men able to handle the routine jobs, several of the more experienced and responsible men were graduated to jobs as foremen. This in turn was so successful that it was a comparatively easy step to continue operations until 5 a.m. As a general plan the company has operated from 7 a.m. until 5 a.m. since the Autumn of 1943.

One point of interest is that there are no shifts as we generally know them. There are now, at the beginning of 1946 a number of part-time men on the payroll and they are still respected and treated the same as full-time employees. Some of the full-time men prefer to work nights, as some of the part-time men are obliged to do. The men are given, for the most part, their choice of hours, so there is coming and going at all times of the day and night.

To control this seeming confusion there are: a superintendent, who is boss of the plant; two shift foremen, and a block machine foreman. The superintendent is responsible for the full operation of the plant for the full 24 hours a day and his actions are for him to decide. He may be there during the day, or during the night, or frequently both.

The two shift foremen alternately work the day and night tricks. For two weeks one works from 7 a.m. until 6 p.m., while the other works from 6 p.m. until 5 a.m. At the end of each two-week period they change. This gives each of them an opportunity to know all the employees and to work with them, with the additional advantage of knowing the responsibilities of both day and night operation. There is considerable rivalry between these shift foremen for high production. The high record for a single shift was made one night in December, 1945, when slightly more than 7,200 blocks were made between 6 p.m. and 6 a.m. the following morning, averaging 600 blocks per hour, the maximum capacity of the Besser Super Vibrapac.

Each shift foreman is boss of yard and plant when he is on duty. He has responsibility and commensurate authority under the direct supervision of the general superintendent.

The machine foreman has a job which meshes in an interesting fashion with that of the shift fore-

man. His hours are from 5 a.m. until 3 p.m. or later. His main job is to get the block machine in condition for the 7 a.m. starting after the night shift has finished its work. It is between 5 a.m. and 7 a.m. that most of the mold changes are made. At this time the machine and mixer and other equipment is thoroughly cleaned and greased, and minor repairs are made. At 7 a.m. when the day men start, the machine is ready to go, and the machine foreman takes the responsibility of seeing that it does go. The shift foreman is usually busy at this time with yard duties, chiefly supervising the loading of trucks, and taking care of whatever emergencies might arise.

As is usual, the men have a few minutes off, morning and afternoon, for coffee or a rest. The machine is not stopped during this time, nor during the noon lunch hour. The machine foreman and shift foremen, as well as other men around the plant are able to do every job necessary to keep the block machine in operation, and by a series of reliefs they accomplish this without loss of time. The only time the Besser is purposely shut off is between 5:30 and 6 p.m. at which time it is given a quick cleaning and oiling, and mold changes are made if necessary. Mold changes are made in 30 to 40 minutes; the record is 20 minutes.

The whole plant operates on the basic thought that nobody makes money unless the plant is producing blocks. Everyone is imbued with that idea and it operates very effectively in keeping the plant running at full speed.

The most interesting development in this three-year program of high production has been the development of men to positions carrying responsibility and better pay. The present superintendent has been with the company 20 years, starting as a truck driver. By his ability and assumption of authority and responsibility he actually held the job of superintendent before he was given the title. The two shift foremen have also been with the company over a period of years. One was a truck driver, the other was a yard man before being appointed to the jobs they now hold. They are all on a salary with the privileges and responsibilities which that entails.

Not all the problems which had to be solved were of personnel. Some physical changes were necessary to make the additional production possible. Mainly the kiln capacity had to be increased. This, while a major operation requiring a degree of ingenuity, some time and money, was accomplished during the latter part of 1943 without too much difficulty.

There were two items which appeared absolutely necessary and for which the Company needed the help of the WPB. These were new racks to accomodate the blocks as they were made, and a new boiler. It required some effort to get permission to buy the necessary steel for the racks but it was finally obtained. The permission for the boiler, however, was impossible to get, and until just recently the Geist plant has operated kilns with a capacity of 12,000 blocks, and heated the plant and office with a 25-hp. boiler.

At the present time the Geist plant is installing a second Super-Vibrapac. New kilns and additional material-handling equipment has been installed. A new 150-hp. boiler is in operation and will take care of the increased kiln space. The operation on a 24-hour basis is being continued throughout the winter and will continue after the additional machine is installed. This will put the Geist plant in the high production bracket in the industry. They expect to make about 6 million blocks in 1946 with high daily production of about 25,000 units.

This path to higher production can well be followed by others in the industry who are determined to increase production but are plagued by the inability to get the necessary additional equipment. Such a production job was done with the limitations imposed by the war. Certainly now it can be done by other manufacturers at this time when the block industry is before the eyes of the nation as a major factor in furnishing the homes so sorely needed by the returning veteran.

Quake-Proof Design

(*from page* 122)

tests. Tested on a span of 8 feet 4 inches, the equivalent lateral load was in the range of 150 pounds per square foot for a nominal 8-inch wall having three vertical reinforced beams spaced at 3 feet. Nominal 8-inch walls with two vertical beams at 3-foot spacing gave equivalent uniform lateral loads slightly over 100 pounds per square foot. A comparison of walls with the same reinforcing but of varying lengths showed that approximately equal total loads were carried by walls 8 feet 9 inches long, 6 feet 9 inches long, and 4 feet 9 inches long, each strengthened by three vertical beams.

Core Beams in Flexure Twelve test beams were constructed of square units of the type shown in Figure 3. The beams were laid up vertically in the same manner as were the walls. Reinforcing was placed in the center in some specimens, as near as possible to the compressive side of the beam in others, and as far as possible from the compressive side in the others, following which the grout was poured. The beams were tested in a horizontal position, supported at points 8 feet 4 inches apart, and loaded at quarter points.

Generally, the beam tests also bore out the conclusions of conformity with reinforced-concrete theory and showed that the location of the steel in the walls had the anticipated effect. The excess strength of wall sections over the strength of the contained number of separate beams confirmed the expectation of a definite T-action in wall assemblies.

Walls in Shear Nine wall panels were tested in shear parallel to the length of the wall and were constructed similar to those used in the flexure tests. The arrangement of the reinforcing steel is shown in Figure 2. Tests were made with the "racking" frame as sketched in Figure 6. The load was applied by hydraulic jack at the bottom in a direction parallel to the wall. Load values were read on a calibrated beam gage. In obtaining measurement of diagonal deformation, some difficulties developed with the result that comparison of deformation could not be recorded.

A synopsis of the shear test result shows that nominal 8-inch walls, 9 feet high by 7 feet long with one vertical beam at each end, carried an average horizontal shearing load parallel to the wall of 28.7 kips. This is equivalent to a thrust at the top of 4.1 kips per foot of wall length. The insertion of a horizontal beam reinforced with two ½-inch bars at a point half way up the wall increased the shearing resistance by 38 per cent. The use of an additional vertical beam with one reinforcing bar, instead of the horizontal beam with two bars, increased the resistance by 20 per cent., indicating a strength effect in almost direct proportion to the amount of steel employed.

Recommendations to be made later by the Pacific Coast Building Officials Conference are certain to result in improved structures of reinforced concrete masonry, particularly in those areas subject to earthquakes, tornadoes, or hurricanes.

AIR ENTRAINMENT, RESEARCH STRESSED AT 42nd ANNUAL A. C. I. CONVENTION

FOLLOWING token conventions on the annual meeting dates of two years during the War, the American Concrete Institute held its first post-war convention at Buffalo, New York, on February 19-21. It was the 42nd annual meeting of this organization. The attendance was unexpectedly large, approximating that of pre-war years, and a spirit of optimism regarding the future of concrete as a structural material prevailed.

Harrison F. Gonnerman, Chicago, manager of the research laboratory of the Portland Cement Association, was installed as president, succeeding Douglas E. Parsons of the Bureau of Standards. Stanton Walker, Washington, D. C., and Robert F. Blanks, Denver, Colorado, were installed as vice-presidents. The following were named as regional directors: Paul W. Norton, Frank H. Jackson, Roy R. Zippradt, Charles S. Whitney, Alexander Foster, Jr., and Huber J. Gilkey. Harvey Whipple was again named secretary-treasurer.

Each of the six sessions of the convention was devoted to a particular topic. These included: new developments in design, entrained air, research, maintenance and repair, curing compounds and admixtures, and new developments in construction methods. Discussion of these professional topics was highlighted by illustrated reports on the effects of atomic bombs in Japan by Capt. E. H. Praeger, (CEC) USNR, and on war damage in Germany by M. A. Swayze, Lone Star Cement Corp. Reports by committees on Standard Requirements for Precast Concrete Floor Units and on Recommended Practice for the Construction of Concrete Silos were approved.

Design Among the new developments in design, John R. Nichols, consulting engineer, Boston, discussed the growing use of radiant or "panel" heating; he pointed out that it is practical and safe to imbed pipes in concrete floors and walls, through which hot water at moderate temperatures, 85 to 110 degrees F., can be circulated.

Douglas McHenry, of the Bureau of Reclamation, outlined a method of solving stresses in deep beams by resolving the problem into a lattice or grid of squares, each of which may be solved by simple arithmetic. Dr. Henri Marcus, of the Bureau of Yards & Docks, described the construction of a 110-foot barge having a 4-inch concrete shell in which pre-stressed reinforcing steel was used; the barge showed exceptional structural stiffness in service.

Harrison F. Gonnerman, new president of the American Concrete Institute.

Air Entrainment At an evening session devoted to consideration of air-entrainment in concrete, the leading paper by C. E. Wuerpel, Central Concrete Laboratory, Corps of Engineers, summarized an exclusive laboratory investigation during the past two years in which it was determined that the air entraining agent must introduce the desired amount and condition of air, must not be too sensitive, must give uniform action, and must be immediately available but must not continue to entrain additional air. He recommended that the agent be added at the mixer. He concluded by stating that "properly controlled air entrainment is advantageous to any concrete."

F. H. Jackson, of the Public Roads Administration, who served as moderator at this session, introduced several men who contributed short papers on the problem of entrained air; the experiences reported indicated growing favor, provided the air content is controlled. R. S. Gray, Portland Cement Assn., presented the comments of Lee Matthews, also of the P.C.A., that test pavements laid in the northeastern states in 1938 to 1942, had shown no scaling when inspected in 1945. L. H. Tuthill presented a statement by W. A. Condon, also of the Bureau of Reclamation, that tests indicated entrained air increased sulphate resistance. Alexander Foster, Jr., Warner Co., Philadelphia, reported that tests on several highway and airport projects with cement containing air inter-ground agent, indicated that the air entrained was about the same with pre-mixing and delivery in agitators, as with job mixing. H. L. Kennedy, Dewey and Almy Chemical Co., Boston, reported that abrasion tests showed a marked increase in wear with increase in air content above 5 per cent. W. F. Kellerman, Public Roads Administration, reported on the greater durability resulting from air entrainment as shown by laboratory freezing and thawing tests. E. W. Scripture, Master Builders Co., Cleveland, pointed out that aeration can be introduced by either foaming or dispersing agents, and that the results of freezing and thawing tests are about the same for a given air content. Stanton Walker and D. L. Bloem, both of the National Ready Mixed Concrete Assn., reported on tests which showed that the air content decreased with increase of temperature. Mr. Kellerman read a description by S. W. Benhauz, Indiana Highway Commissioner, of a method for determining the air content by immersing a hook-gage in a weighed volume of wet concrete. Mr. Jackson briefed a statement by W. H. Herman, Pennsylvania Department of Highways, that their experience had been with inter-ground agents, which had caused a great reduction in scaling. Mr. Wuerpel stated that recent observations of mass concrete containing aggregate up to 6 inches had indicated that the benefits from air entrainment were about the same as for paving. Two types of meters for introducing measured quantities of an agent at the mixer were described by other speakers.

Research At a session devoted to the discussion of research on concrete with Professor Frank E. Richart acting as moderator, the results from a variety of projects were given. Mr. Walker reported that the durability of concrete is increased by using dry aggregates and is decreased by soaking the speci-

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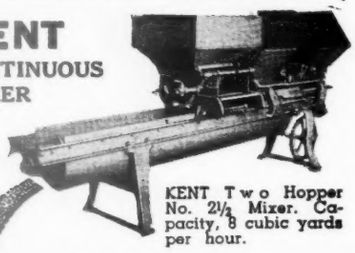

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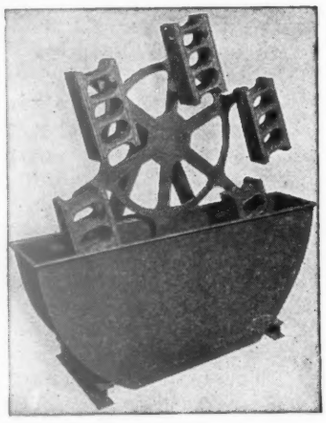

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mens before testing. Rudolph Valore, Jr., National Bureau of Standards, observed that the change of volume is substantially the same for slow and fast freezing to 20 degrees. F. F. J. Simpson, Hydro-Electric Power Commission of Ontario, reported that in cubes of concrete exposed in the vicinity of Toronto, the north side experienced 76 per cent more cycles of freezing and thawing than experienced by the air temperature, and the south side experienced only one-fifth as many cycles as the north side. J. C. Pearson, Lehigh Portland Cement Co., reported on the comparison of air contents in mortar and typical paving and structural concretes, with several treated cements. A. T. Goldbeck, National Crushed Stone Association, reported the improvement of a concrete mixed with certain aggregates, from poor durability to good durability, by the introduction of an agent at the mixer to entrain from 2½-to-6½ per cent. air as desired. Mr. McHenry described tests wherein specimens broke under sustained compression loads of 88 per cent. as great as the strength shown by standard procedures.

Maintenance and Repair The session which considered maintenance and repair of concrete at which R. B. Young, Hydro-Electric Power Commission of Ontario, served as leader, presented a number of advanced procedures with various types of structures. B. D. Keatts, Intrusion—Prepakt, Inc., presented a paper by Professor J. W. Kelly, University of California, and himself, which described two repair methods; the forcing of grout into the cracks and fissures of a structure and its foundation, and the packing of a coarse aggregate into a space being repaired and the subsequent filling of voids by grout, thereby producing a solid mass. Miles N. Clair, consulting engineer, Boston, presented a description by W. M. Bassett, N. E. Power Service Co., and himself of methods used in repairing two 175-foot concrete chimneys whose surface had become eroded.

Awards Following the presentation of awards at the following evening session, at which R. F. Blanks presided, H. W. Meissner, of the Bureau, read a paper by Messrs. Blanks, Tuthill and himself describing the tests used by the Bureau in evaluating membrane curing compounds in terms of 14 days of water curing. An informative report was given by Capt. Praeger, of the observations by a Navy commission which he headed, of the effects of the atomic bombs on the Japanese cities of Hiroshima and Nagasaki. He stated that in general reinforced concrete structures more than 2,000 feet from the center of the bomb explosions were not seriously damaged structurally. The effects over a radius of several miles were about what would be expected from a very high velocity air movement for the brief period of a fraction of a second; concrete stacks and

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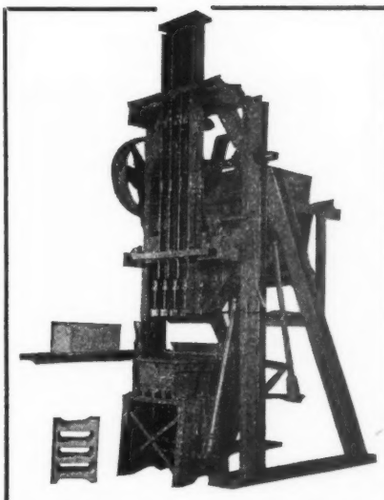

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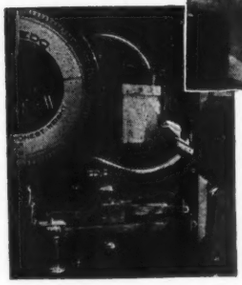

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trees were usually left standing. Capt. Prager's photographs of damaged buildings were intensely interesting. He remarked that future design should be based on resistance to dynamic instead of static conditions.

The session closed with a review by J. C. Powers, P. C. A., of his laboratory research upon the flocculated condition of normal cement paste in concrete mixes. His review led to the conclusion that the usual clusters of cement particles should not be broken up or dispersed. Dr. E. W. Scripture discussed briefly the application of dispersing agents.

War Experiences The concluding session was devoted to new developments and war experiences in concrete construction. Comdr. I. S. Rasmussen (CEC) USNR, discussed the extensive use of concrete produced with native coral aggregates by the Seabees in the Pacific islands; although high in fines and weighing 90 to 100 pounds per cu. ft., clean coral has produced concrete of 4000 pounds strength or greater. A. Amirikian, Bureau of Yards and Docks, described the assembly of precast, thin shell, reinforced concrete boxes to form such structures as a barge which weighed only 10 pounds per cu. ft. Views of the work in casting the boxes and assembling into barges were shown by F. R. MacLeaf, Corbetta Construction Co. C. P. Disney, Canadian National Railways, described the use of pre-packed concrete around H-beams in constructing bridge piers in deep water or under conditions where caisson procedure was difficult or impossible; he predicted a growing use of that method on future bridge construction. V. S. Murray, Ontario Dept. of Highways, presented movies of the application of vacuum methods in casting and moving such units as house-walls and trusses up to 35 feet. The meeting closed with a description by M. A. Swayze of a recent inspection of war damage in Germany. He observed that most of the cement produced in Germany during the war was a low quality of our Class 1, and that much was blended with furnace slag; however, the highways showed no scaling and were in excellent condition except where actually bombed. His picture included views of construction under way at the close of the war in installing concrete roofs from 4- to 10-feet thick over several manufacturing plants as protection against HE bombs.

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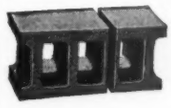
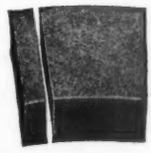


This concrete block, converted into a special size, was cut completely in two in 19 seconds.

One of the many intricate cuts performed on first quality clay brick for heat treating furnaces —made in 8 sec.



Rotary Kiln Blocks, cut to size for "key" bricks in rotary kilns, require only 10 sec. for completion of cut.

Basic refractories for steel furnaces or cement kilns must be accurately installed. This magnesite brick was cut in 12 seconds!

Clipper Saws are available for trial. Write for Descriptive Catalogs.

THE Clipper "CUTS RIGHT THRU" MANUFACTURING COMPANY

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NOW!

An *Electric* LIFT-TRUCK for less than $1,000!

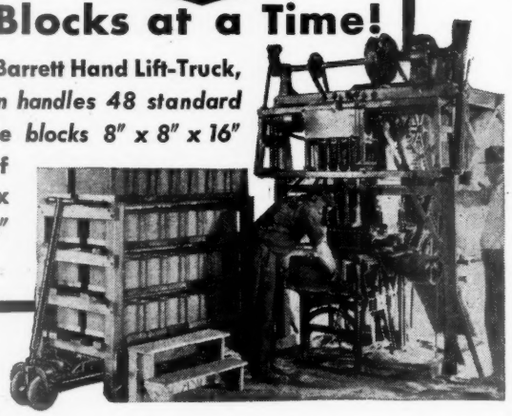
No longer must you choose between "muscling" your concrete over those long hauls or going in for big, high-cost power trucks. Less than $1,000 now brings you the new Barrett PowerOx, a combination of hand lift and electric drive that takes any load up to 4,000 lbs.—cuts time and effort to a minimum!

Loads are raised with a few short strokes of the PowerOx handle. Forward and reverse motion is electric . . . controlled entirely by push buttons. Automatic brake, dual motors, rear wheel drive. Ask a Barrett engineer to show you how quickly a PowerOx pays for itself—or write for full details!

For Short Hauls—the BARRETT HAND LIFT-TRUCK

48 Blocks at a Time!

With a Barrett Hand Lift-Truck, one man handles 48 standard concrete blocks 8" x 8" x 16" (or 32 of the 8" x 12" x 16" size).



"SOFT" HANDLING ASSURED!

Shock-reducing rubber tires and super-spring frame assure your blocks a soft ride from machine to curing room and right through storage. Write for descriptive circular!

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Representatives in All Principal Cities
Canadian Licensee: S. A. Armstrong, Ltd., Toronto, Canada

Barrett Handling Equipment

BARRETT

ONE MAN DOES MORE THAN 3 OR 4 . . . WITH A BARRETT

SHOW THIS TO YOUR CUSTOMERS

Unretouched photograph showing blocks partially painted with Medusa Paint

● Cash in on the sale of paint to concrete or light-weight aggregate block users. It's easy! Lay up four or five blocks, then paint them like those above. This display impresses your block customers with the advantages of painting block construction with Medusa Portland Cement Paint. Put in a stock of Medusa Paint, ready to supply their needs, for you'll sell this paint!

Medusa Portland Cement Paint, with its base of triple-ground White Portland Cement, keys itself to the surface of the concrete block, making a weatherproof, decorative, permanent, cement-like finish. Your customers will like its economies because it is inexpensive in first cost, mixes with water, can be easily brushed or sprayed on damp or dry, exterior or interior surfaces. There are eight colors, black and white to choose from, but white and stone gray will satisfy over half of the demand. Write today for complete details on stocking Medusa Portland Cement Paint and for a copy of the booklet, "Painting Concrete, Stucco and Masonry".

MEDUSA
PRODUCTS DIVISION

MEDUSA PORTLAND CEMENT COMPANY
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Gentlemen: Please send me a copy of the booklet, "Painting Concrete, Stucco and Masonry".

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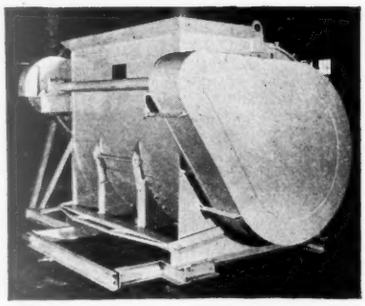

This powerful, heavy-duty CONCRETE MIXER is equipped with two spiral blades, hardened liners and precision roller bearings . . . capable of meeting every production requirement in the efficient operation of your Block Plant.

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For making pipe by hand methods by either the wet or semi-dry processes. Built to give many years of service—sizes for any diameter pipe from 12 to 84 inches—tongue and groove or ball-end pipe at lowest cost.

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Complete information, prices and estimates sent on request. Also manufacturers of Quinn Concrete Pipe Machines.

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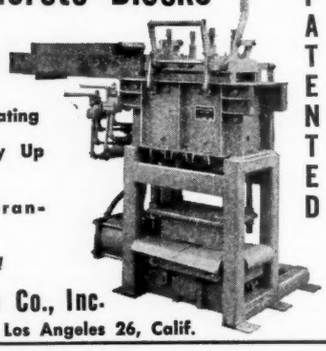
- Interlocking Units Lay Up Perfectly
- Exclusive Territorial Franchise Protects You



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For improved plasticity and resistance to freezing and thawing

Darex AEA*

*Reg. U. S. Pat. Off.

What is Darex AEA? Darex AEA is a water-soluble air-entraining agent that comes ready to use for addition at the mixer. With Darex AEA, the amount of air entrained in concrete can be controlled, so that after an initial mixing period the air content of the concrete remains relatively uniform.

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Is not super-sensitive Small variations in the amount of Darex AEA used are not critical and do not greatly affect the air. This makes for safe use, even with unskilled labor.

Gives improved plasticity Darex AEA works on the sand constituent of concrete as an air-entraining agent and does not react with the alkali in the cement. It gives plasticity and workability, which permit substantial water cuts, make the concrete easy to place, tend to reduce bleeding, and eliminate segregation of the aggregates.

Gives improved durability Darex-AEA-treated concretes containing 3-6% entrained air give remarkable resistance to freezing and thawing.

Proved in use Darex AEA has already been used in over four million cubic yards of concrete. This figure is based on sales to consumers.

Use DAREX AEA with confidence wherever air-entrained concretes are specified.

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IN AIR-ENTRAINED CONCRETES IT'S THE Controlled Air THAT COUNTS

DEWEY AND ALMY CHEMICAL COMPANY
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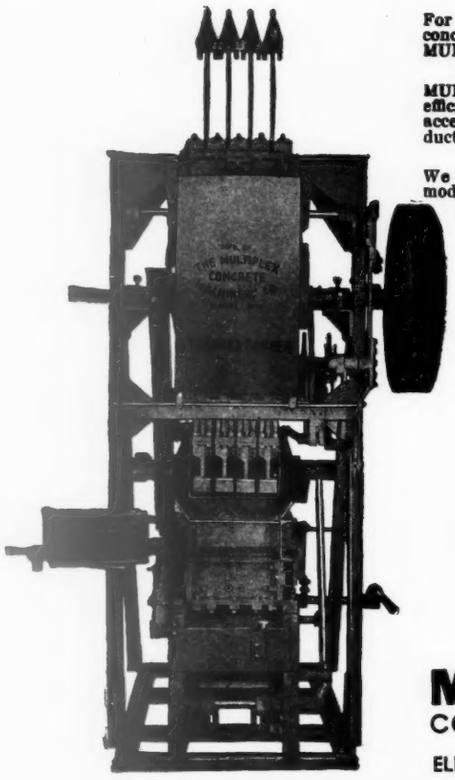
MULTIPLEX Machines For Postwar Profits



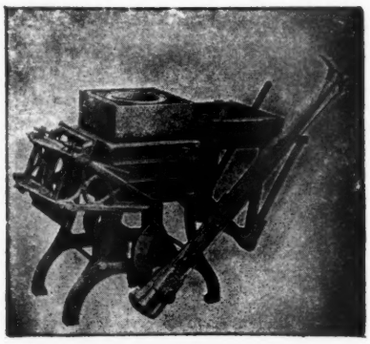
For a Quick "Take-Off" and sustained pace in concrete block output, reserve one of the MULTIPLEX *high-speed* machines.

MULTIPLEX offers a wide variety of super-efficient mixing equipment, with all types of accessories necessary for economical mass production.

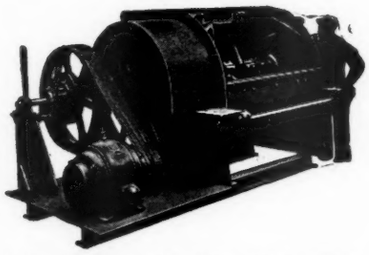
We can recommend MULTIPLEX units for modernizing *your* plant and enlarging its capacity.

Our universal type MULTIPLEX Standard Tamper for making plain and stripper, or face blocks, on one base. Easily convertible as business expands. Supplied with 4-bar or 8-bar tamper, either power or hand operated.

Write for Booklet describing the MULTIPLEX complete line of concrete mixing equipment, including Double and Single Hand Press Strippers, Power Press Strippers, and Super-Tampers.



The MULTIPLEX Flue Block Machine makes ventilated, solid or lightweight units, including all attachments for ventilator and stove pipe openings.



MULTIPLEX Multi-Mixer with reverse screw-type action insures fast and thorough mixing of every batch. Side, end or bottom discharge.

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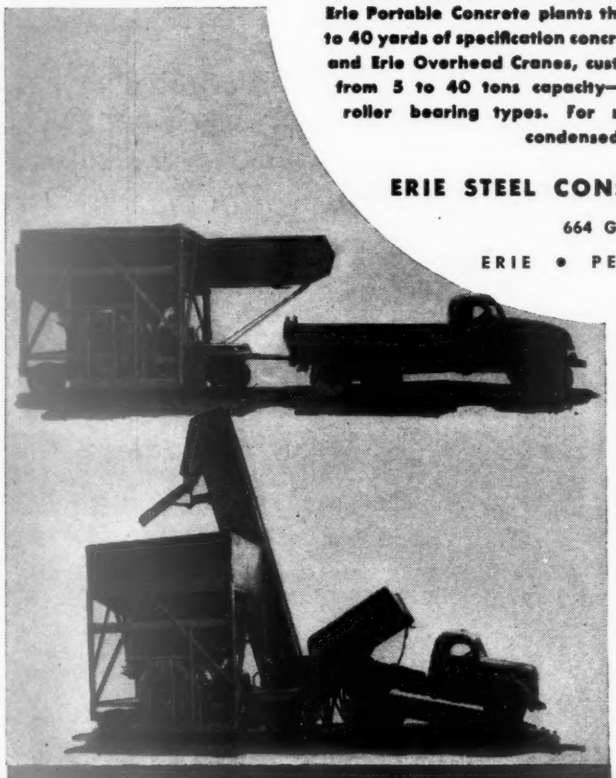

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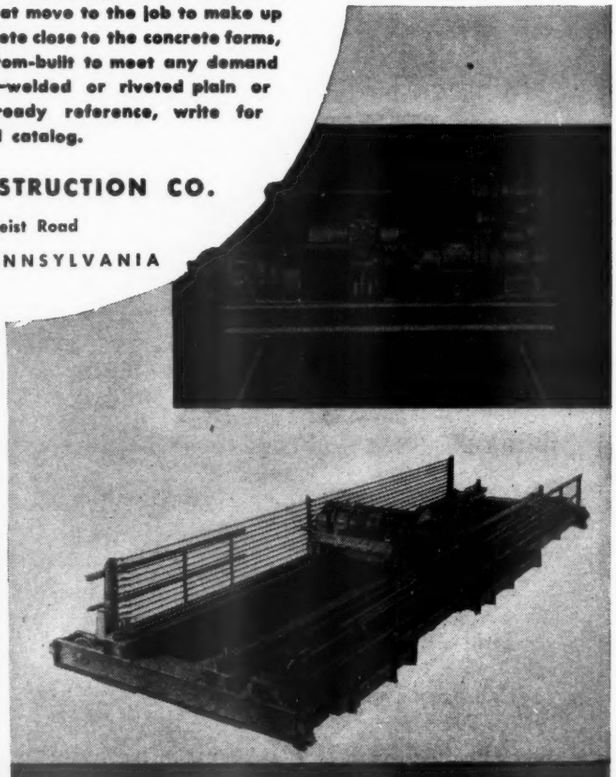

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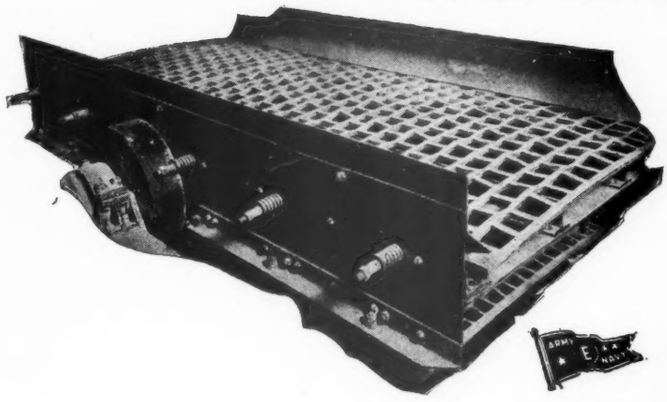

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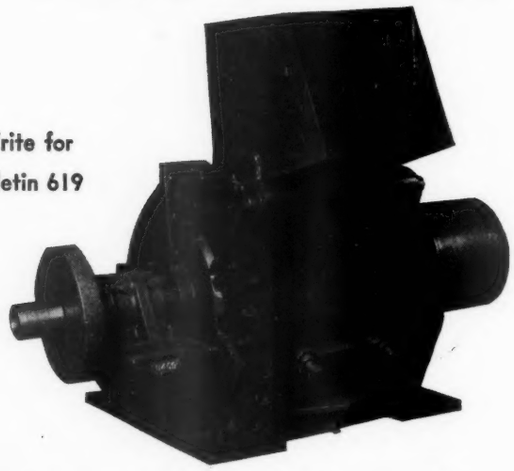

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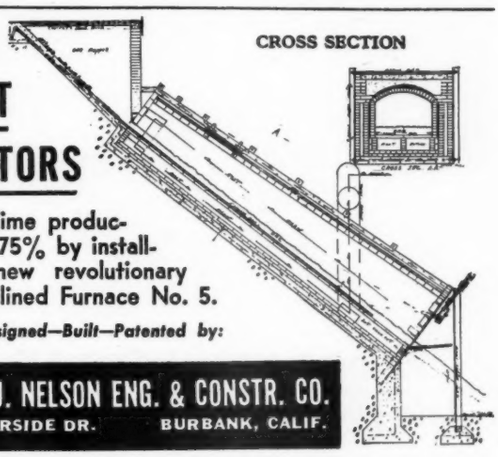

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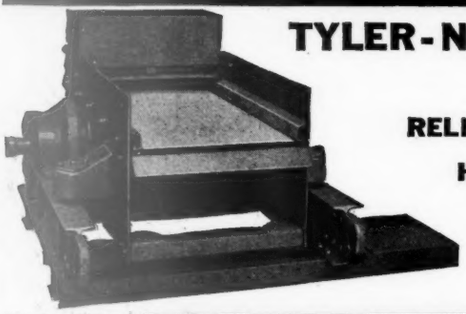
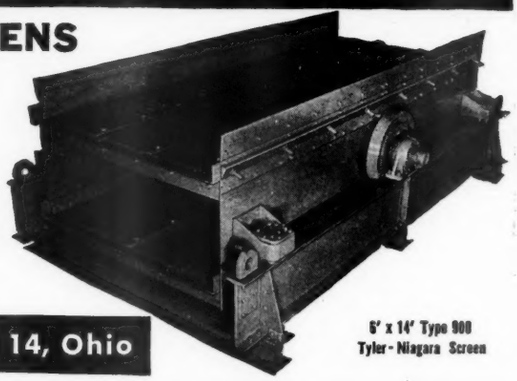


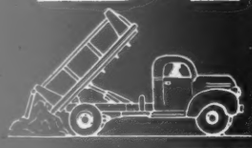
2' x 4' Type 100 Tyler-Niagara Screen



6' x 14' Type 900 Tyler-Niagara Screen

THE W. S. TYLER COMPANY, Cleveland 14, Ohio

DAYBROOK



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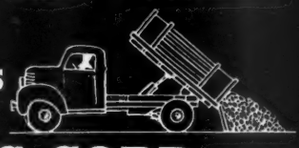

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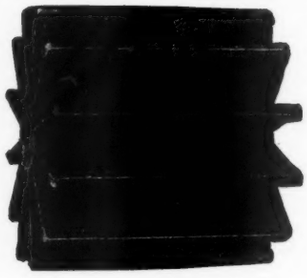

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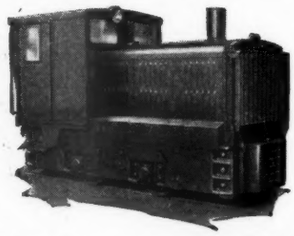

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New middle-west industrial sand plant. Replies treated in confidence. Write qualifications in detail, past production record, brief personal history, salary expected.

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PLANT SUPERINTENDENT to assume responsibility for production and maintenance of plant located in the East, producing limestone products by the wet and dry process. Applicant should be familiar with crushing, grinding, screening, air classification, wet classification, filtering and drying equipment. In reply please give detailed information regarding experience, salary received and salary expected.

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One, 6-ft. dia. manganese steel lined wet grind ball mill, by 4-ft. to 5-ft. long, in good condition, with one or two 36-inch dia. Akins type classifiers. Drives and ball charge optional.

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30"	5	1/8"	1/16"
24"	5	1/8"	1/32"
24"	4	1/8"	1/32"
20"	5	1/8"	1/32"
20"	4	1/8"	1/32"
18"	4	1/8"	1/32"
16"	4	1/8"	1/32"
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¾"	25 "	6.25	2.50 "
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JAW CRUSHERS: 1—36 x 42, all steel, deep frame type, with or without 150 H.P., slip ring, motor and controls. Also, sizes 12 x 24 to 48 x 60.

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ROLL CRUSHERS: 1—12" face, 20" dia. New condition.

SOFT STONE ELIMINATOR: Stedman Disintegrator, 42" with or without 100 H.P. motor.

SWINGER: 1—Clyde 5 H.P., electric, powered with G.E., 5 H.P., 3 phase, 60 cycle, 440 volt, slip ring Motor with drum controller.

VIBRATOR FEEDER: Jeffrey Traylor 6' x 6', open pan deck, powered by four No. 5 heavy M-4 motors, including motor generator equipment for 440 volt, 3 phase, 60 cycle operation; capacity 1500 tons of earth and stone per hour, maximum size stone 3' cubes.

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SCREENS: Robins, Link-Belt, Simplicity, Nordberg, Telsmith, Traylor; all sizes.

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SHOVEL: Bucyrus Erie 120-B, 5 yd. capacity, 4 yd. manganese rock dipper, Ward Leonard control equipment, 3 phase, 60 cycle, 2300 volt. 1—Bucyrus Erie 50-B Diesel Dragline, 70' boom, capacity 1½ yd., with light plant.

TRACTORS: Model 75, diesel, Caterpillar, serial 2B972, with motor B82R, LePlante-Choate Bulldozer model RSC; LeTourneau power control unit. Lynn 20 ton, 6 cylinder, Hercules engine, rear dump, steel and wood body.

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CRANE: Lima 12 ton capacity, 45' boom, powered with 85 H.P., D8800 diesel motor.

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1—10' Gayco Air Separator
1—8' Gayco Air Separator
1—Impactor Penna. Crusher
1—No. 2 Climax Jaw Crusher
1—6" x 20" Farrell Bacon Jaw Crusher
1—Telsmith Primary Breaker, No. 10-A, Shop No. 1070
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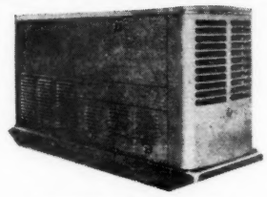

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1—150 HP Buckeye 400 RPM engine only.

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3—200 KVA G. E. 22000—230/460 V.
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HP	Make	Type	Volts	Speed
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700	Westinghouse	CW	2200	502
300	Gen. Elec.	I-M	2200	514
500	Gen. Elec.	I-P	2200/440	450
150	Westinghouse	CW	2200/440	1200
100	Westinghouse	vert	2200	1160
100	Ideal	AY	2200/440	720
100	Westinghouse	HF	440	23u
75	Allis Chal.		440	72u
50	Gen. Elec.	I-M	440	900

TRANSFORMERS

KVA	Make	Type	Volts
10000	Pittsburgh	OISC	13200/4600
667	Gen. Elec.	A	33000/2300
333	Kuhlman		33000/2300/440
150	Kuhlman		33000/2300/440
100	Gen. Elec.	H	33000/440
75	Westinghouse	S	3810/122/244
75	Westinghouse	SK	33000/440

Also NEW units all sizes and volts.

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Several—Coolant pumps, 10 GPM 10 ft. head, with ball brg. 3/60/220/440 motors.

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Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. 1,000 cu. ft.

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1—Buchanan jaw crusher, size 10x16".
1—Acme jaw crusher, Ser. No. 1875, size 12x20".
1—No. 3 Champion jaw crusher, size 7½x13".
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4—Steel guy derricks. 1—20 ton Insley 115' mast, 100' boom. 2—20 ton American steel guy derrick, 90' boom. 1—15 ton American steel derrick, 83' mast, 75' boom. 1—5 ton Terry Guy Derrick, 70' mast, 60' boom.
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ricks. 1—110' mast, 110' boom; 1—100' mast.
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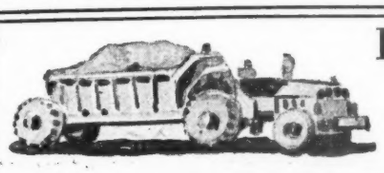

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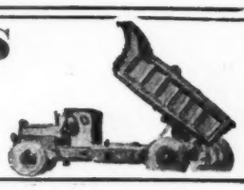

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New 1943 and '44

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30 Ton 1942 Model 30-S Orton Steam Locomotive Cranes.
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Gravel Plant Machinery

1½ cu. yd. Sauerman Slackline Cableway, 800 ft. Span.
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3 Story Structural Steel Screening and washing structure over bins—bolted.

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260' Quaker 18" 5-Ply, 28 oz. ⅛x1/32"
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Conveyor belting delivery from the factory is still tough. Better anticipate your requirements now—troughing rolls, head and tail pulleys, etc., now in stock.

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P&H "Model 400" Crawler Gas Shovel, ¾ yd. Overhauled.
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IMMEDIATE DELIVERY

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Priced at one-third the original cost.

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80 Ton American Locomotive 0-6-0
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Pullshovel attach. for Lorain 80, 77, 75A or 75B
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46—KOPPEL, 1½ Yd., 24 & 30 In. Ga., V Shaped.
15—2 Yd., 3 Yd., 4 Yd. 36 In. Ga.
20—Sd. Ga. 12 Yd., 16 Yd., 20 Yd. & 30 Yd. Cap.

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6x8 Continuous Pebble Mill.
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RAYMOND Auto. Pulverizer No. 0000, 0 & 3.
RAYMOND Imp Mills No. 4, 32 & 55.
GRUENDLER XXR Mill & Jay Bee No. 3 & 4.
RAYMOND 4 & 5 ROLL MILLS & 5 Ft. Chaser Mill.

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14 ft., 8 ft. and 12 ft. Separators

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36x60 Fairmont Single Roll.
36x20 Diamond Double Roll.
24x24 & 36x16 & 36x20 Diamond Double Roll.

JAW CRUSHERS
10x8, 13x7½, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 20x11, 26x12, 30x15, 30x13, 36x30, 36x18, 36x14, 36x15, 35x9, 36x6, 38x18, 36x10, 36x24, 42x9, 48x36, 60x42, 84x66, 36x16, 9x36.
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18 in., 24 in., 30 in., 36 in. and 48 in. Symons Disc.
21K & 18N Allis Chalmers.
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2—Traylor T-12 Bulldog Gyratory.
8 in. Traylor T. Gyratory, Telsmith No. 9.
17 Gates K—Nos. 1, 4, 5, 6, 7½, 8 & 9½.
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6, 10 & 13 Inch Superior McCullys.
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5—Koehring & Smith 27E Pavers.

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8 Electric 20, 35, 50, 60, 100 & 150 H.P.

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Williams No. 1 Jumbo Jr., & No. 6 Universal.
Nos. 4, 6 & 8 Williams Jumbo.
No. 36 Am. Ring Roll.
Greundler No. 6X.

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3—1000 Lb. & 2000 Lb. Pug Mixers.
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140 HP Fairbanks Morse.
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343 K.W. F.M. 3/60/480 v.
240 K.W. F.M. 3/60/2300 v.
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INDEX TO ADVERTISERS

Ace Co., The..... 136
Acker Drill Co..... 143
Acme Road Machinery Co..... 151
*Allis-Chalmers Tractor Division.... 43
Agency—Bert S. Gittins
*American-Cable Div. American Chain & Cable Co., Inc....Inside Back Cover
Agency—Reincke, Meyer & Finn, Inc.
American Conveyor Co..... 107
Agency—Gebhardt and Brockson, Inc.
*American Hoist & Derrick Co..... 141
Agency—The Buchen Co.
American Manganese Steel Co..... 100
Agency—Advertising Producers-Associated
*American Pulverizer Co..... 108
Agency—Eggers-Rankin Adv. Serv.
Anaconda Wire & Cable Co., Subsidiary of Anaconda Copper Mining Co. 41
Agency—Ivey & Ellington, Inc.
Anchor Concrete Machinery Co..... 133
Atlas Powder Co..... 12
Agency—The Aitkin-Kynett Co.
Atlantic Equipment Co..... 153
*Austin-Western Co. 20
Agency—Evans Associates Inc.

*Babcock & Wilcox Co..... 39
Agency—O. S. Tyson and Company, Inc.
*Barber-Greene Co. 25
Agency—The Buchen Co.
Barrett-Cravens Co. 134
Agency—The Buchen Co.
Baughman Manufacturing Co., Inc. 114
Bay City Shovels, Inc..... 48
Agency—Seemann & Peters, Inc.
*Bemis Bro. Bag Co.....14-15
Agency—Gardner Advertising Co.
Berg Vault Co..... 136
Birmingham Rail & Locomotive Co. 148
Blatt Sales Co., Inc., Frank I..... 138
*Blaw-Knox Division of Blaw-Knox Co. 144
Agency—The Al Paul Lefton Co., Inc.
Bonded Scale Co..... 149
Bradley Pulverizer Co..... 106
Brew, Woltman & Co., Inc..... 149
Brill Equipment Co..... 149
Broadcast Section 145-153
*Brooks Equipment & Mfg Co..... 143
Agency—Gage Rex Wamsley

Buckeye Traction Ditcher Co..... 24
Agency—Advertising Producers-Associated
*Buell Engineering Co., Inc..... 58
Agency—Donovan & Thomas, Inc.
Burnham, Royal E..... 145

Carlyle Rubber Co., Inc..... 147
Agency—Sam J. Gallay Co.
Chicago Electric Co..... 149
Chicago Perforating Co..... 105
*Chicago Pneumatic Tool Co..... 13
Agency—G. M. Basford Co.
*Cincinnati Rubber Mfg. Co., The.. 104
Agency—Flottman Company
Clark Tructractor Co..... 135
Agency—Gebhardt & Brockson, Inc.
Cleveland Rock Drill Division of the Cleveland Pneumatic Tool Co..... 21
Agency—The Bayless-Kerr Co.
Cleveland Wire Cloth & Mfg. Co., The 155
Clipper Manufacturing Co..... 133
Cohn & Sons, E..... 146
Columbia Construction Co., Inc.... 148
*Columbus Conveyor Co..... 143
Consolidated Diesel Electric Corp... 98
Agency—Michel-Cather, Inc.
Consolidated Products Co., Inc..... 153
Continental Gin Co..... 154
Agency—Sparrow Adv. Agcy., Inc.

Davey Compressor Co..... 113
Agency—Palm & Patterson, Inc.
Daybrook Hydraulic Corp..... 144
Agency—Steve C. Brown
Dempster Brothers 18
Agency—Charles S. Kane Co.
*Denver Equipment Co..... 106
De Soto Foundry, Inc..... 9
Agency—Bozell & Jacobs, (La.) Inc.
Dewey & Almy Chemical Co..... 137
Dreifus Co., Charles..... 150
du Pont de Nemours & Co., E. I... 110
Agency—Batten, Barton, Durstine & Osborn, Inc.

*Eagle Crusher Co., Inc..... 116
*Eagle Iron Works..... 94
Agency—Advertising Producers-Associated
Economy Company, Inc.....146, 149
*Ehrsam & Sons Mfg. Co., J. B..... 116
Eighmy Equipment Co..... 146
Elastic Stop Nut Corp. of America. 99
Agency—G. M. Basford Company

Electric Steel Foundry..... 97
Agency—Simon & Smith
*Ensign-Bickford Co., The..... 27
Agency—Wm. B. Remington, Inc.
Equipment Corporation of America. 149
Erickson Special Equipment Mfg. Co. 136
*Erie Steel Construction Co..... 140
Agency—Davies and McKinney

Farrel-Bacon 107
Agency—Gassaway, Mark & Co.
Fawick Airflex Co., Inc..... 36
Agency—Fuller & Smith & Ross, Inc.
Ford Motor Co..... 50
Agency—J. Walter Thompson Co.
*Fuller Co. 26

Gates Rubber Co., The..... 37
Agency—Cloyd F. Woolley, Inc.
Goodyear Tire and Rubber Co., Inc.. 3
Agency—Kudner Agency, Inc.
Gulf Oil Corp., Gulf Refining Co... 11

Haiss Manufacturing Co., Inc., Geo. 23
Agency—Hicks & Greist, Inc.
*Hanson Clutch & Machinery Co.... 142
Agency—Coleman Todd and Associates
*Hardinge Co., Inc..... 105
Agency—W. H. Long Co.
Harnischfeger Corporation 53, 116
Agency—The Buchen Co.
*Hazard Wire Rope Division American Chain & Cable Co., Inc. 49
Agency—Reincke, Meyer & Finn, Inc.
Heidenreich, Jr., E. Lee..... 145
*Hendrick Mfg. Co..... 141
Agency—G. M. Basford Co.
Highway Equipment Co., Inc..... 46

Independent Pneumatic Tool Co.... 10
Agency—Evans Associates, Inc.
Industrial Plants Corp..... 151
Inland Equipment Co..... 148
International Harvester Co. of America 47
Agency—Aubrey, Moore & Wallace, Inc.
*Iowa Manufacturing Co..... 5
Agency—Russell T. Gray, Inc.
Iron & Steel Products Co.....149, 153

*Jaeger Machine Co., The..... 135
Agency—Mumm, Mullay & Nichols, Inc.

***See also Detailed Information in 1945 Pit and Quarry HANDBOOK**

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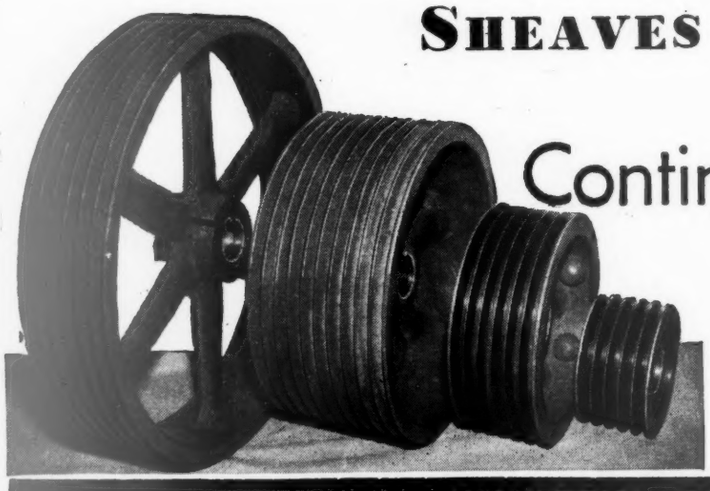

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INDEX TO ADVERTISERS (*Continued*)

*Jeffrey Manufacturing Co..... 31
Agency—Byer & Bowman Adv. Agcy.
*Johnson Co., The C. S..... 135
Agency—Arnold Andrews
*Jones & Laughlin Steel Corp..... 156
Agency—Bond & Starr, Inc.

*Kennedy-Van Saun Mfg. & Engr. Corp. 34, 35
Kent Machine Co..... 132
Koehring Company 16
Agency—Arnold Andrews
Kotal Company 42
Agency—Charles Blum Adv. Corp.
Kremser & Sons, Inc., Frank A.... 147

*LaPlant-Choate Manufacturing Co., Inc. 112
Agency—Russell T. Gray, Inc.
*Leschen & Sons Rope Co., A..... 116
Agency—Ross Adv. Agency
*Link-Belt Co. 1
Linn Mfg. Corp., The..... 143
Agency—Alfred Fischer Adv. Agcy.
Ludlow-Saylor Wire Co.....
.....Inside Front Cover

Mack Trucks, Inc..... 22
Agency—McCann-Erickson, Inc.
Manhattan Rubber Division of Raybestos Manhattan, Inc..... 40
Agency—Roland G. E. Ullman Orgn.
Marion Steam Shovel Co., The
.....Outside Back Cover
Agency—The Jay H. Maish Co.
*McLanahan & Stone Corp..... 113
Agency—Walker & Downing Adv.
*Meckum Engineering, Inc..... 114
Agency—Gage Rex Wamsley
Medusa Portland Cement Co..... 134
Agency—Will Inc.
Minneapolis-Moline Power Implement Co. 115
Agency—Graves & Associates
*Morris Machine Works..... 102
Agency—Barlow Adv. Agcy., Inc.
Mortarless Tile Machine Co..... 136
*Multiplex Concrete Machy. Co..... 138

*National Bearing Division of American Brake Shoe Company..... 33
Agency—H. George Bloch Adv. Co.

*Nelson Engineering & Construction Co., Victor J..... 143
New Holland Machine Co..... 96
*Nordberg Mfg. Co..... 52

Onan & Sons, D. W..... 141
Agency—Graves and Associates
O'Neill, A. J..... 148
*Owen Bucket Co., The..... 155
Agency—T. H. Ball and Sons.
Peerless Lime Products Co., Inc... 148
Pennsylvania Drilling Co..... 145
Pershing, H. E..... 153
Plymouth Locomotive Works, Div. of the Fate-Root-Heath Co..... 144
Agency—Howard Swink Adv. Agcy.
Power Equipment Construction Co.. 136
Prendergast, W. J..... 145

Quinn Wire & Iron Works..... 136
Agency—Lessing Adv. Co., Inc.

*Raymond Pulverizer Div. of Combustion Engineering Co., Inc..... 4
Agency—Gage Rex Wamsley
Rental Equipment Co..... 147
Republic Rubber Div., Lee Rubber & Tire Corp. 91
Agency—Wearstler Advertising, Inc.
Rollway Bearing Co., Inc..... 8
Agency—Barlow Adv. Agcy., Inc.

*St. Regis Paper Co..... 51
Agency—G. M. Basford Co.
*Sauerman Bros., Inc..... 108
Schaffer Poidometer Co..... 109
Schoonmaker Company, A. G..... 146
Schoonmaker, Robert 148
*Schramm, Inc. 57
*Scientific Concrete Service Corp.... 133
*Screen Equipment Co., Inc..... 95
Agency—Melvin F. Hall Adv. Agcy., Inc.
Service Supply Corp. 150
Shell Oil Co., Inc..... 89
Agency—J. Walter Thompson Co.
Sinclair Refining Co..... 93
Agency—Hixson-O'Donnell Adv., Inc.
*Smidth & Co., F. L..... 38
Smith Engineering Works.....44-45
Agency—The Cramer-Krasselt Co.

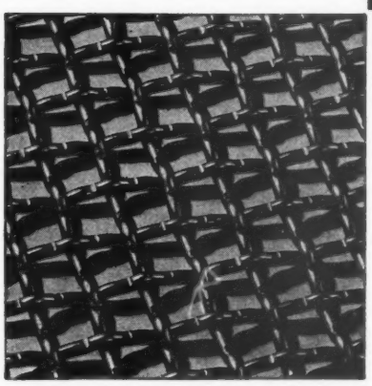
Socony Vacuum Oil Co., Inc..... 6-7
Agency—Compton Adv., Inc.
Southern Iron & Equipment Co..... 148
Sprout, Waldon & Co., Inc..... 144
Stanhope, Inc., R. C..... 151
*Stearns Mfg. Co., Inc..... 117
Agency—R. Marshall Adv. Agcy.
*Sullivan Machinery Co..... 29
Agency—Russell T. Gray, Inc.

Texas Company, The..... 55
Agency—Buchanan & Co., Inc.
Thornton Tandem Co..... 143
Agency—Creative Agency Associates
Tinney Drilling Co..... 145
*Traylor Engineering & Mfg. Co.... 17
Trojan Powder Co..... 101
Agency—Richard A. Foley Adv. Agency, Inc.
Troyer, Stanley B..... 146
Truk Loder Co..... 138
*Tyler Co., The W. S..... 144

Union Pacific Railroad..... 19
Agency—The Caples Co.
United States Rubber Co..... 30
Agency—Campbell-Ewald Co., Inc.
Universal Atlas Cement Co..... 118
Agency—Batten, Barton, Durstine & Osborn, Inc.
*Universal Engineering Corp..... 111
Agency—Advertising Producers-Associated
*Universal Vibrating Screen Co..... 143
Unverzagt & Sons, G. A..... 147
Upson Walton Co..... 2
Agency—Griswold-Eshleman Co.

War Assets Corp., a Subsidiary of Reconstruction Finance Corp..... 32
Agency—Fuller & Smith & Ross, Inc.
*Wellman Engineering Co..... 115
Agency—Griswold-Eshleman Co.
*Wickwire-Spencer Steel Co..... 28
Agency—Fuller & Smith & Ross, Inc.
*Williams Patent Crusher & Pulverizer Co. 142
Willson Products, Inc..... 109
Agency—Beaumont, Heller & Sperling, Inc.

***See also Detailed Information in 1945 Pit and Quarry HANDBOOK**



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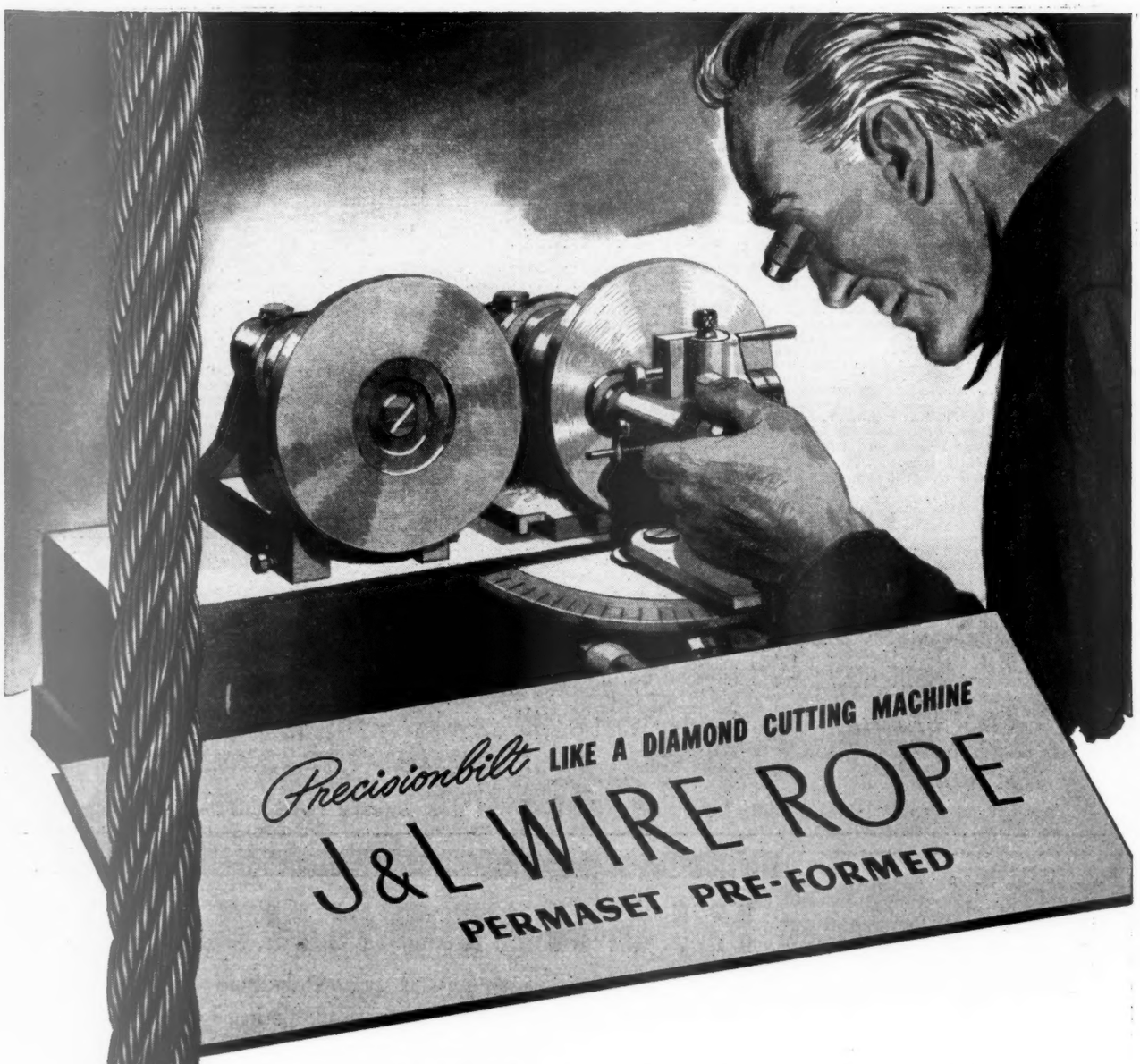

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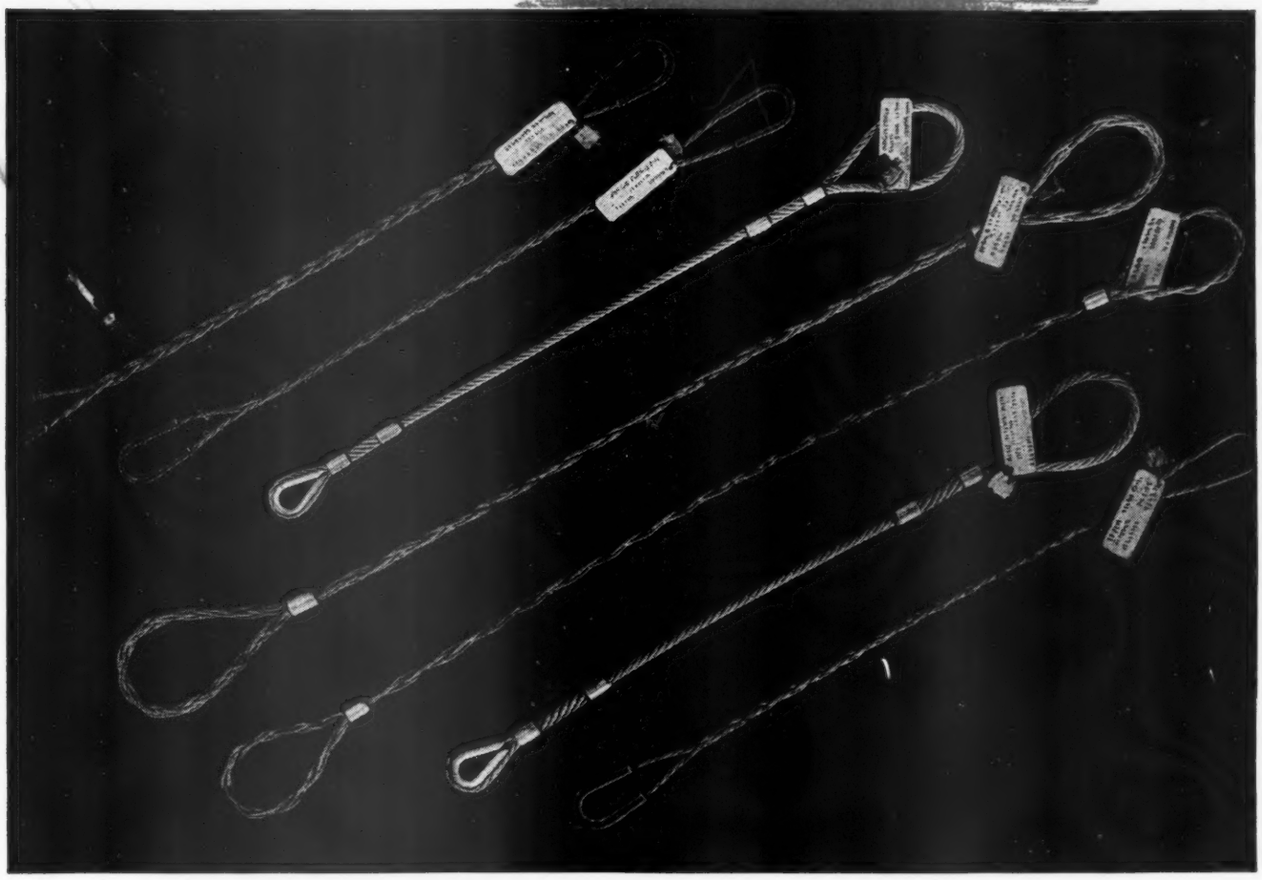

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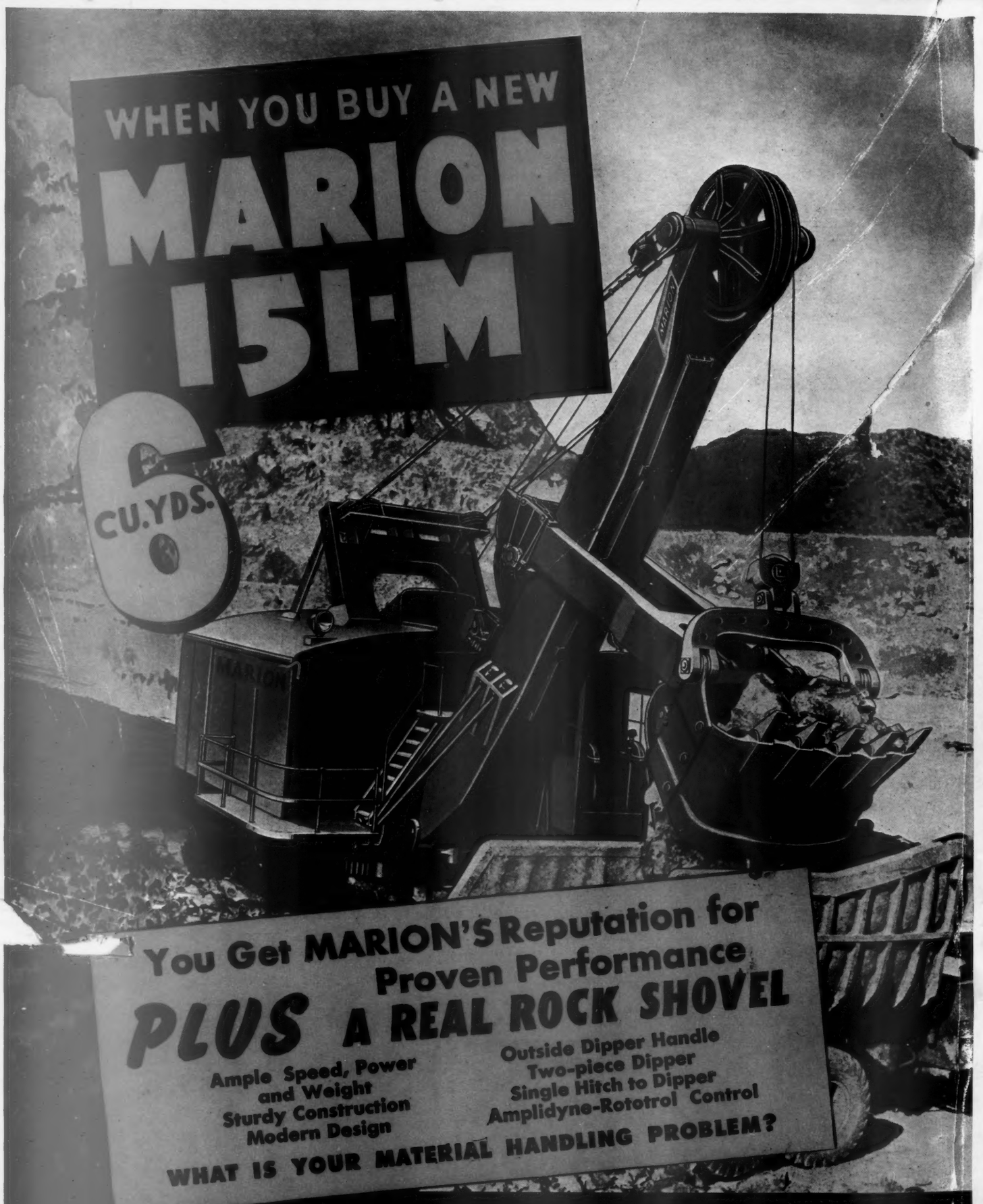

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